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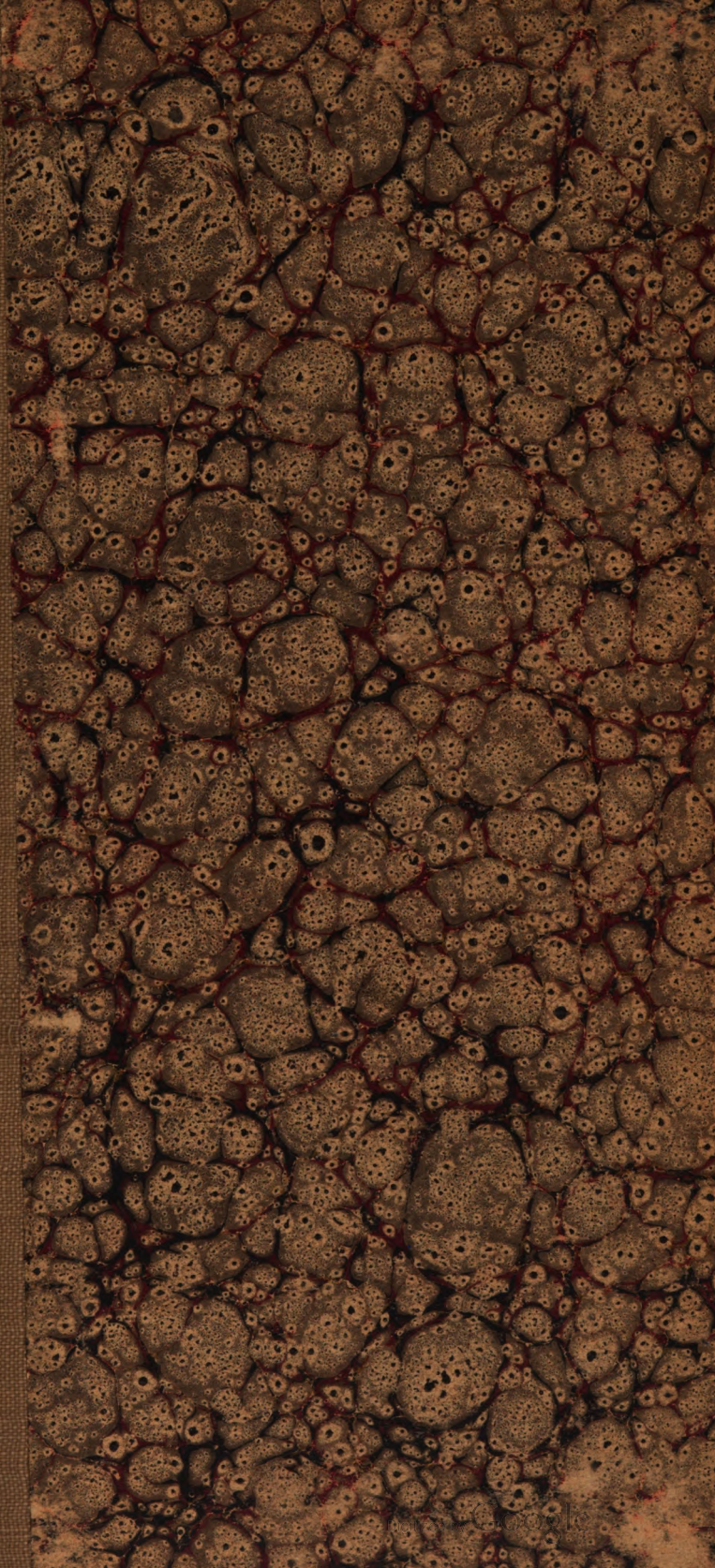
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Wilson, W. — *Species cruciata*. II. Decapoda + Stomatopoda. (1901)

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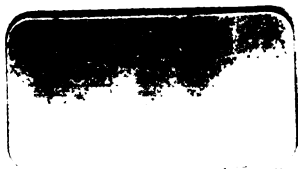
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21,423.

ARCTIC CRUSTACEA

COLLECTED DURING THE SWEDISH ARCTIC EXPEDITIONS 1898, 1899 AND
1900 UNDER THE DIRECTION OF PROFESSOR A. G. NATHORST
AND MR. G. KOLTHOFF

II.

DECAPODA, SCHIZOPODA

BY

AXEL OHLIN.

WITH [✓]3 PLATES.

COMMUNICATED OCTOBER 9, 1901.

REVISED BY HJ. THÉEL AND CHR. AURIVILLIUS.

STOCKHOLM

KUNGL. BOKTRYCKERIET. P. A. NORSTEDT & SÖNER
1901

In this paper I am going to continue with the enumeration and description of Arctic Crustaceans collected mainly on Professor A. G. NATHORST's expeditions in the years 1898 and 1899 to Spitzbergen and East Greenland resp. In my previous paper¹ I have given some information as to the purpose of, and the zoological work done during those voyages, therefore I think it unnecessary here to reiterate it. But, besides the material collected during those trips, I had at my disposal the rather large collection of crustaceans obtained during the Swedish Zoological Arctic Expedition of 1900 under the direction of Mr. G. KOLTHOFF, of the University of Upsala. This eminent ornithologist equipped an expedition to Spitzbergen, Jan Mayen, and East Greenland, mainly for the purpose of making collections of vertebrates and of studying their biology. But the other branches of zoological science were not neglected by this zealous naturalist. He, therefore, engaged, to study the marine fauna, Mr. HJ. ÖSTERGREN, M. A., who has contributed by his valuable papers to an increased knowledge of the Holothurians, and Mr. TH. ODHNER, B. A., who acted as his assistant. These gentlemen dredged and trawled at no less than 30 stations, most of them, viz. stat. 16—28, situated off East Greenland, mainly in the neighbourhood of Franz Joseph's Fiord. Stations 1—12 are situated off the west coast of Spitzbergen, 13—14 off Jan Mayen, and 29—30 in the deep basin between East Greenland and Jan Mayen. Some interesting deep-sea crustaceans were also obtained by means of the vertical towing-net from depths up to 3000 meters.

When the collections of Mr. KOLTHOFF's expedition were handed to me, most of the decapods were already determined by Dr. E. LÖNNBERG, of the University of Upsala. Therefore it is only a few of the more interesting of these forms which I have myself examined. Those determined by Mr. LÖNNBERG

I have marked with »det. LÖNNBERG». I take advantage of this opportunity of offering him my best thanks for the kindness with which he placed at my disposal his notices about the localities of the species determined by him.

Here as in my preceding paper, I have also examined a small collection of Decapoda collected by Mr. TH. WULFF, M. A., on his trip to Spitzbergen with the Swedish-Russian Expedition for measuring latitudes, in the summer of 1899.

The collections of the Arctic Expeditions 1898 and 1899 belong to the »Riksmuseum», (State Museum) at Stockholm, those of the Expedition 1900 to the University Museum at Upsala, and Mr. WULFF's collection to the University Museum of Lund, which collections have been kindly placed at my disposal by the resp. directors, Professors HJ. THEËL, T. TULLBERG, and A. W. QUENNERSTEDT. To Prof. A. G. NATHORST, who first asked me to work up these collections, I also wish to express here my great gratitude.

Our knowledge of the carcinological fauna of East Greenland and the seas East of Spitzbergen, round King Charles' Land, has been considerably augmented by these expeditions. As far as I know, the only papers treating of East Greenlandian crustaceans are BUCHHOLZ' important memoir in »Zweite Deutsche Nordpolarfahrt in den Jahren 1869 und 1870 etc.» 1874 and a short list of HANSEN, viz. »Pycnogonider og Malacostrake Krebsdyr» in »Meddelelser om Grönland», Bd. XIX, 1895.

The following *Decapoda* and *Schizopoda* are recorded by those authors as occurring off that coast, viz. *Selerocrangon boreas* (PHIPPS), *Selerocrangon ferox* (G. O. SARS), *Nectocrangon lar* (OWEN), *Hippolyte turgida* KRÖYER, *Hippolyte polaris* (SABINE), *Hippolyte groenlandica* (J. C. FABRICIUS),? *Hippolyte incerta* BUCHHOLZ, *Bythocaris Panschii* (BUCHHOLZ), *Hymenodora glacialis* (BUCHHOLZ), *Nyctiphanes norvegica* (M. SARS), *Rhoda Raschii* (M. SARS), and *Mysis oculata* (O. FABRICIUS).

This list must now be increased by the following species, viz. *Sabinea septemcarinata* (SABINE), *Bythocaris simplicirostris* G. O. SARS, *Bythocaris Payeri* (HELLER), *Hippolyte Gaimardi* H. MILNE EDWARDS, *Hippolyte spinus* (SOWERBY), *Rhoda inermis* (KRÖYER), *Boreomysis nobilis* G. O. SARS, *Pseudomma roseum* G. O. SARS, *Pseudomma Théeli* n. sp., *Erythrops abyssorum* G. O. SARS, *Erythrops glacialis* G. O. SARS, *Parerythrops*

robusta (SMITH), *Parerythrops spectabilis* G. O. SARS, *Mysideis grandis* (GÖES), and *Mysis mixta* LILLJEBORG.

Thus, the number of *Decapoda* and *Schizopoda* known from the East Greenlandian seas is, by the Swedish Expedition, raised from 11 (12?) up to 26 (27?) species. Further researches will, no doubt, still more increase their number and prove that that part of the Arctic Sea is as rich in crustaceans as the rest. However, it is worth while remarking the strange fact that some species which are elsewhere rather common in the Arctic, have not as yet been obtained off East Greenland. Such species are f. i. *Hyas araneus* (LINNÉ), *Hyas coarctatus* LEACH, *Eupagurus pubescens* (KRÖYER) and *Pandalus borealis* KRÖYER. Other species as *Hippolyte turgida* KRÖYER and *Hippolyte groenlandica* (J. C. FABRICIUS) seem to be very scarce, as they were obtained at only a very few stations out of about fifty where dredgings were carried on by the expeditions in 1899 and 1900. Farther below, in the special description, I have remarked such strange occurrences in the geographical distribution.

As is well known, the seas round Spitzbergen, Franz Joseph Land, and Nova Zembla, have been much better explored, and belong, doubtless, to the best known, in a zoological respect, of all parts of the Arctic Ocean. It would increase the length of this paper very much, if I tried to write an historical review of the expeditions which have brought home carcinological material from those regions. I content myself, therefore, with referring the reader to the bibliography, where he will find a somewhat exhaustive list of papers dealing with the malacostracous fauna of those seas.

Strangely enough, there was, however, a restricted area of Barents Sea which was nearly unknown until 1898. I mean the sea E. of Spitzbergen, round King Charles' Land. It was only once, in 1889, that it was visited by naturalists. In that year, KÜKENTHAL and WALTER spent the summer in dredging and trawling in that sea. The material is not yet fully worked out. According to DOFLEIN l. c. p. 323, PFEFFER within a short time, is going to publish the results of his examination of the *Decapoda*. In 1898, no less than three expeditions visited the sea E. of Spitzbergen, viz. the Swedish Expedition on board the »Antarctic», the German »Helgoland» Expedition, and that of the Prince of Monaco on board the »Prin-

	Siberian Polar Sea.	Bering Sea.	Polar Archipelago of N. America.	Labrador and East Coast of N. America.	Baffin Land.	Smith Sound.	West Greenland.	East Greenland.	Jan Mayen.	Cold Area of North Atlantic.
<i>Decapoda.</i>										
<i>Hyas araneus</i> (LINNÉ)	—	—	—	+	—	—	+	—	—	—
<i>coarctatus</i> LEACH	—	+	—	—	—	—	+	—	—	—
<i>Eupagurus pubescens</i> (KRÖYER)	—	—	—	+	—	—	+	—	—	—
<i>Anapagurus lævis</i> (THOMPSON)	—	—	—	—	—	—	—	—	—	—
<i>Sclerocrangon boreas</i> (PHIPPS)	—	—	+	+	+	+	+	+	+	—
<i>ferox</i> (G. O. SARS)	—	—	—	—	—	—	+	+	—	—
<i>Crangon Allmanni</i> Kinahan	—	—	—	—	—	—	—	—	—	—
<i>Cheraphilus echinulatus</i> (M. SARS)	—	—	—	—	—	—	—	—	—	—
<i>Pontophilus norvegicus</i> M. SARS	—	—	—	+	—	—	+	—	—	+
<i>spinosus</i> (LEACH)	—	—	—	—	—	—	—	—	—	—
<i>Nectocrangon lar</i> (OWEN)	—	+	+	+	+	+	+	+	—	—
<i>Sabinea septemcarinata</i> (SABINE)	—	—	—	+	—	—	+	+	—	—
<i>Bythocaris simplicirostris</i> G. O. SARS	—	—	—	—	—	—	—	+	—	—
<i>leucopsis</i> G. O. SARS	—	—	—	—	—	—	—	—	+	—
<i>Payeri</i> (HELLER)	—	—	—	—	—	—	—	+	+	—
<i>Hippolyte Gaimardii</i> H. M. EDW.	+	+	+	+	+	+	+	+	—	—
<i>spinus</i> (SOWERBY)	—	+	—	+	+	+	+	+	—	—
<i>turgida</i> KRÖYER	—	+	+	+	+	+	+	+	—	—
<i>pusiola</i> KRÖYER	—	—	—	+	—	—	—	—	—	—
<i>polaris</i> (SABINE)	—	+	—	+	+	+	+	+	—	—
<i>groenlandica</i> (J. C. FABRICIUS)	—	+	+	+	+	+	+	+	—	—
<i>Pandalus borealis</i> KRÖYER	—	—	—	+	—	—	+	—	—	—
<i>Pasiphæa tarda</i> KRÖYER	—	—	—	+	—	—	+	—	—	—
<i>Hymenodora glacialis</i> (BUCKHOLZ)	—	—	—	—	—	—	—	—	—	—
<i>Schizopoda.</i>										
<i>Nyctiphanes norvegica</i> (M. SARS)	—	—	—	+	—	—	—	+	+	—
<i>Rhoda inermis</i> (KRÖYER)	—	—	—	+	—	—	+	+	—	—
<i>Thysanoëssa longicaudata</i> (KRÖYER)	—	—	—	+	—	—	+	—	—	—
<i>Boreomysis nobilis</i> (G. O. SARS)	—	—	—	—	—	—	+	+	—	—
<i>scyphops</i> G. O. SARS	—	—	—	—	—	—	—	—	—	—

— Indicates that the species has been obtained during the Swedish

Notes.		Vertical distribution (m.).	Mediterranean.	Baltic.	Castegat.	British Islands.	Iceland.	North-Sea coast of Norway.	Finnmark.	Murman Coast.	West Spitz- bergen.	East Spitz- bergen.	Barents Sea.	Kara Sea.	Franz Joseph Land.
	(?) Kamtschatka and Ochotsk.	10—250	—	—	—	—	—	+	+	+	+	—	+	+	—
		10—250	—	—	—	—	—	+	+	+	+	—	+	+	—
	Puget Sound.	5—100	—	—	—	—	—	+	+	+	+	—	+	+	—
	Azores.	100—200	—	—	—	—	—	+	+	+	+	—	+	+	—
	¹ rare.	5—100	—	—	—	—	—	+	+	+	+	—	+	+	—
		100—1000	—	—	—	—	—	+	+	+	+	—	+	+	—
		40—150	—	—	—	—	—	+	+	+	+	—	+	+	—
		100—150	—	—	—	—	—	+	+	+	+	—	+	+	—
		200—1229	—	—	—	—	—	+	+	+	+	—	+	+	—
	Adria.	60—150	+	—	—	—	—	+	+	+	+	—	+	+	—
		10—250	—	—	—	—	—	+	+	+	+	—	+	+	—
		10—300	—	—	—	—	—	+	+	+	+	—	+	+	—
		250—900	—	—	—	—	—	+	+	+	+	—	+	+	—
		1750—2750	—	—	—	—	—	+	+	+	+	—	+	+	—
		200—2000	—	—	—	—	—	+	+	+	+	—	+	+	—
		10—500	—	—	—	—	—	+	+	+	+	—	+	+	—
	¹ Hippolyte Lilljeborgi.	10—500	—	—	—	—	—	+	+	+	+	—	+	+	—
		10—150	—	—	—	—	—	+	+	+	+	—	+	+	—
		10—110	—	—	—	—	—	+	+	+	+	—	+	+	—
		10—600	—	—	—	—	—	+	+	+	+	—	+	+	—
		10—500	—	—	—	—	—	+	+	+	+	—	+	+	—
		100—500	—	—	—	—	—	+	+	+	+	—	+	+	—
		?—3000	—	—	—	—	—	+	+	+	+	—	+	+	—
		?—6500	—	—	—	—	—	+	+	+	+	—	+	+	—
		0—2000	—	—	—	—	—	+	+	+	+	—	+	+	—
	Bay of Biscay, North Polar Basin.	0—2000	—	—	—	—	—	+	+	+	+	—	+	+	—
		0—1500	—	—	—	—	—	+	+	+	+	—	+	+	—
	North Polar Basin.	200—1700	—	—	—	—	—	+	+	+	+	—	+	+	—
	Southern Ocean.	2000—4000	—	—	—	—	—	+	+	+	+	—	+	+	—

Arctic Expeditions 1898, 1899 or 1900 in the sea thus marked.

	Siberian Polar Sea.	Behring Sea.	Polar Archipelago of N. America.	Labrador and East Coast of N. America.	Baffin Land.	Smith Sound.	West Greenland.	East Greenland.	Jan Mayen.	Cold Area of North Atlantic.
<i>Amblyops Crozetii</i> WILLEMORS-SUHM . . .	—	—	—	—	—	—	—	—	—	+
" <i>Sarsi</i> n. sp.	—	—	—	—	—	—	—	—	—	—
<i>Pseudonima rosenum</i> G. O. SARS	—	—	—	+	—	—	—	+	—	—
" <i>Théeli</i> n. sp.	—	—	—	—	—	—	—	+	—	—
<i>Erythroptus Goësi</i> (G. O. SARS)	—	—	—	+	—	—	+	—	—	—
" <i>abyssorum</i> G. O. SARS	—	—	—	—	—	—	+	+	—	—
" <i>glacialis</i> G. O. SARS	—	—	—	—	—	—	—	+	—	+
<i>Parerythroptus robusta</i> (SMITH)	—	—	—	+	—	—	—	+	—	—
" <i>spectabilis</i> G. O. SARS	—	—	—	—	—	—	+	+	—	+
<i>Mysideis grandis</i> (GOËS)	—	—	—	—	—	—	+	+	—	—
<i>Mysis oculata</i> (O. FABRICIUS)	—	—	—	—	—	+	+	+	+	—
" <i>mixta</i> LILLJEBORG	—	—	—	+	—	—	+	+	—	—
<i>Pseudomysis abyssi</i> G. O. SARS	—	—	—	—	—	—	—	—	—	+

cesse Alice». As far as I know, it is only the collections of *Decapoda*, obtained during the German Expedition, which are worked up by DOFLEIN. The result is published in »Fauna Arctica» l. c.

From the sea around King Charles' Land, from Hinlopen Strait, or from the Stor Fiord, the following species were collected: *Pandalus borealis* KRÖYER, *Sclerocrangon ferox* (G. O. SARS), *Sclerocrangon boreas* (PHIPPS), *Sabinea septemcarinata* (SABINE), *Hippolyte Gaimardii* H. MILNE EDWARDS, *Hippolyte pusiola* KRÖYER,? *Hippolyte turgida* KRÖYER, *Hippolyte spinus* (SOWERBY), *Hippolyte polaris* (SABINE), *Eupagurus pubescens* (KRÖYER) and *Hyas araneus* (LINNÉ). All these species were also collected from the sea E. of Spitzbergen during the Swedish Expedition 1898. I cannot add any other *Decapoda* to that list. Of *Schizopoda* only the common *Mysis oculata* (O. FABRICIUS) was obtained from King Charles' Land.

During the Swedish Arctic Expeditions trawlings were carried on at some stations in depths exceeding 1000 metres, and yielded some interesting forms. Among these, I wish

Bibliography.

1553. BELL, TH. A History of the British Stalked Crustacea.
1892. BENEDICT, J. E. Preliminary descriptions of thirty-seven new species of hermit crabs of the genus *Eupagurus* in the U. S. National Museum for the year 1892. Vol. XV, p. 1—26.
1897. BIRULA, A. Recherches sur la biologie et zoogéographie, principalement des mers russes. III. Essai d'une faune des crustacés décapodes de la mer Blanche et Mourmanne; Annuaire du Musée zoologique de l'Académie Impériale des Sciences de St. Pétersbourg. 1897. n:o 4. p. 405—452, tab. XX—[XXII] (in Russian).
1851. BRANDT, F. Krebse; Middendorff's Reise in den äussersten Norden und Osten Sibiriens. Bd. II. Zoologie, Th. 1. Wirbellose Thiere, p. 77—148, tab. V—VII.
1874. BUCHHOLZ, R. Crustaceen; Die Zweite Deutsche Nordpolarfahrt in den Jahren 1869 und 1870 unter Führung des Kapitän KARL KOLDEWEY. Bd. 2. Wissenschaftliche Ergebnisse, p. 263—399. taff. 1—15.
1898. CALMAN, W. T. On a Collection of Crustacea from Puget Sound; Ann. N. Y. Acad. Sci. XI. n:o 13, p. 259—292, pl. XXXI—XXXIV.
1899. — On the British Pandalidæ; Ann. Mag. Nat. Hist. Ser. 7, Vol. III. p. 27—39, pl.—IV.
1896. CAULLERY, M. Crustacés Schizopodes et Décapodes; Résultats scientifiques de la Campagne du »Caudan» dans le Golfe de Gascogne; Annals de l'Université de Lyon, p. 365—419, pl. XIII—XVII.
1900. DOFLEIN, F. Die dekapoden Krebse der arktischen Meere; Fauna Arctica, Bd. I. Lief. 2. p. 313—362.
1893. FAXON, W. Preliminary Descriptions of New Species of Crustacea; Reports on the Dredging Operations off the West Coast of Central America to the Galapagos, to the West Coast of Mexico, and in the Gulf of California, in charge of Alexander Agassiz, carried on by the U. S. Fish Commission Steamer »Albatross» during 1891, Lieut.-Commander Z. L. TANNER, U. S. N. Commanding; Bull. Mus. Comp. Zool. Harvard College, Cambridge. Vol. XXIV. n:o 7. p. 149—220.
1866. GERSTAECKER, A. Crustacea, fortgesetzt von ORTMANN, A. E.; Bronn, Klassen und Ordnungen des Thier-Reichs. Bd. V. Abtheil 1, 2.
1864. GOËS, A. Crustacea decapoda podophthalmia marina Sueciæ, interpositis speciebus norvegicis aliisque vicinis, enumerat

- —; Öfv. Kgl. Vet. Akad. Förh. Årg. 20. 1863. p. 161—180.
1888. GOUBRET, P. Révision des Crustacés podophthalmes du Golfe de Marseille suivie d'un essai de classification de la classe des crustacés; Ann. du Mus. d'hist. nat. de Marseille, Zool. T. III. Mem. n:o 5, p. 1—212, pl. I—XVIII.
1887. HANSEN, H. J. Oversigt over det vestlige Grönlands Fauna af malakostrake Havkrebsdyr. Malacostraca marina Groenlandiæ occidentalis; Vidensk. Meddel. fra den naturhist. Foren. i Kjöbn. 1887. p. 1—226. tab. II—VII.
1887. — Oversigt over de paa Dijnphna-Togtet indsamlede Krebsdyr; Dijnphna-Togtets zoologisk-botaniske Udbytte, p. 183—286, tab. XX—XXIV.
1895. — Pycnogonider og Malakostrake Krebsdyr; Meddelelser om Grønland XIX, p. 119—132.
1863. HELLER, C. Die Crustaceen des südlichen Europa. Crustacea podophthalmia.
1878. — Die Crustaceen, Pycnogoniden und Tunicaten d. K. K. Österr.-Ungar. Nordpol-Expedition; Denkschriften d. K. Akademie der Wissenschaften, Math.-Naturw. Classe, Bd. 35. p. 25—46, tab. I—V.
1882. HOEK, P. P. C. Die Crustaceen gesammelt während der Fahrten des »Willem Barents« in den Jahren 1878 und 1879; Nierländisches Archiv für Zoologie, Supplem. Bd. I. Lief. 3. p. 21—75. taf. I—III.
1862. KINAHAN, J. R. On the Britannic Species of Crangon and Galathea; with some Remarks on the Homologies of these Groups; Transact. Roy. Irish Academy. Vol. XXIV, pt. II. p. 45—113.
1886. KOELBEL, C. Crustaceen, Pycnogoniden und Arachnoideen von Jan Mayen; Die Österreichische Polarstation Jan Mayen. Beobachtungs Ergebnisse. Bd. III. p. 39—58, taf. III—IV.
1838. KRÖYER, H. Grönlands Amfipoder beskrevne; Danske Videnskabernes Selskabs naturv. og math. Afhandl. Deel VII, p. 229—326, tab. I—IV.
- 1838—39. — Conspectus Crustaceorum Groenlandiæ; Naturhist. Tidsskrift. Bd. 2. p. 249—261.
- 1840—41. — Udsigt over de nordiske Arter af Slægten Hippolyte; ibidem. Bd. 3. p. 570—579.
1842. — Monografisk Fremstilling af Slægten Hippolyte's nordiske Arter; Kongel. Danske Videnskabernes Selskabs naturv. og math. Afhandl. Deel IX. p. 209—360, tab. I—IV.
- 1842—43. — De hidtil bekjendte nordiske Krangon-arter; Naturhist. Tidsskrift, Bd. 4. p. 217—276, tab. IV—V.
- 1844—49. — Karcinologiske Bidrag, ibidem, R. 2, Bd. 1. p. 283—345, tab. II, III, p. 453—638, tab. VI—VII. Bd. 2 p. 1—211, tab. I, II, p. 366—446, p. 527—609, tab. VI.

1846. KRÖYER, H. Crustacés; Voyage en Scandinavie, en Laponie, en Spitzberg, et aux Féroë pendant les années 1838, 1839 et 1840 sur la Corvette La Recherche par M. PAUL GAIMARD 1842—48.
1859. — Forsög til en monographisk Fremstilling af Krebsdyrslægten Sergestes. Med bemærkninger om Dekapodernes Hörereds kabler; Kongl. Danske Videnskab-Selskabs Skrifter. Naturvid. og Math. Afdel. Række 5, Bd. 4, Hefte 2. p. 217—804, tab. I—V.
- 1861—63. — Et Bidrag til Kundskab om Krebsdyrfamilien Mysidæ; Naturhist. Tidsskrift. R. 3. Bd. 1. p. 1—75, tab. I, II.
1815. LEACH W. E. A tabular View of the external Characters of four Classes of Animals, which LINNÉ arranged under Insecta; with the Distribution of the Genera composing three of these Classes into Orders etc. and Descriptions of several New Genera and Species; Trans. Linn. Soc. London. Vol. XI. p. 306—400.
1853. LILLJEBORG, W. Hafs-Crustaceer vid Kullaberg. Öfv. Vet. Akad. Förhandl. Årg. 9. 1852. p. 1—13.
1877. MEINERT, FR. Crustacea Isopoda, Amphipoda et Decapoda Danicæ: Fortegnelse over Danmarks Isopode, Amphipode og Decapode Krebsdyr; Naturhist. Tidsskrift. R. 3. Bd. XI. p. 56—248.
1880. — — idem. Förste Tillæg. ibidem. R. 3. Bd. XII. p. 465—512.
1875. METZGER, A. Crustaceen aus den Ordnungen Edriophthalmata und Podophthalmata; Die Expedition zur physikalisch-chemischen und biologischen Untersuchung der Nordsee im Sommer 1872; Jahresber. d. Comm. z. wissensch. Unters. d. deutschen Meere in Kiel. Jahrg. II, III. p. 277—309, taf. VI. fig. 7—10.
1877. MIERS, E. J. List of the Species of Crustacea collected by the Rev. A. E. EATON at Spitzbergen in the summer of 1873, with their Localities and Notes; Ann. Mag. Nat. Hist. Ser. 4. Vol. XIX. p. 131—140.
1877. — Report on the Crustacea collected by the Naturalists of the Arctic Expedition in 1875—76; ibidem, Ser. 4. Vol. XX. p. 52—66. p. 96—110, pl. III, IV.
1881. — On a small Collection of Crustacea made by EDWARD WHYMPER Esq., chiefly in the N. Greenland Seas; with an Appendix on additional Species collected by the late British Arctic Expedition; Journ. Linn. Soc. London. Zool. Vol. XV. p. 59—73.
- 1834—40. MILNE EDWARDS. Historie naturelle des Crustacés, comprenant l'anatomie, la physiologie et la classification de ces animaux. T. I—III. avec atlas.
1894. MILNE-EDWARDS, A. & BOUVIER E. L. Crustacés Decapodes provenant des campagnes du yacht l'Hiron-

- delle (1886, 1887, 1888). Pt. I. Brachyures et Anomoures; Résultats des campagnes scientifiques accomplies sur son yacht par Albert I:er Prince Souverain de Monaco publiés sous sa direction avec le concours du Baron JULES DE GUERNE, Fase. VII. p. 1—112. pl. I—XI.
1892. NORMAN, A. M. British Schizopoda of the Families Lophogastridæ and Euphausiidæ; Ann. Mag. Nat. Hist. Ser. 6 Vol. IX, p. 454—464.
1892. — On British Mysidæ, a Family of Crustacea Schizopoda; ibidem Ser. 6. Vol. X. p. 143—166, p. 242—263. pl. IX, X.
1895. OHLIN, A. Bidrag till kännedomen om malakostrakfaunan i Baffin Bay och Smith Sound; Acta Reg. Soc. Physiogr. Lund. T. VI. p. I—XXII, p. 1—70. pl. I.
1891. ORTMANN, A. Die Decapoden-Krebse des Strassburger Museums. II. Zool. Jahrb. Abth. f. Syst. etc. Bd. V. p. 693—750. Taf. XLVII.
1893. — Decapoden und Schizopoden der Plankton-Expedition; Ergebnisse der Plankton-Expedition der Humboldt-Stiftung, Bd. II. G. b. p. 1—120, Taf. I—X.
1896. — A Study of the systematic and geographic distribution of the decapod family Crangonidæ BATE; Proc. Acad. Nat. Sciences Philadelphia. 1895. p. 173—197.
1886. PFEFFER, G. Mollusken, Krebse und Echinodermen von Cumberland-Sund nach der Ausbeute der deutschen Nordexpedition 1882 und 1883; Jahrb. Hamburg. Wissensch. Anstalt. Jahrg. III, p. 23—50. Taf. I.
1890. — Die Fauna der Insel Jeretik, Port Wladimir, an der Murman-Küste. Nach den Sammlungen des Herrn Kapitän HORN. Th. I. = = Krebse = =; ibidem, Jahrg. VII, p. 63—96.
1893. RATHBUN, M. J. Catalogue of the Crabs of the Family Majidæ in the U. S. National Museum; Proc. U. S. Nat. Museum, Vol. XVI, p. 63—103, pl. III—VIII.
1884. RICHTERS, F. Beitrag zur Kenntniss der Crustaceenfauna des Behringsmeeres; Abhandl. Senckenberg. Naturforsch. Gesellschaft (Frankfurt a. M.) Bd. XIII, p. 401—407, Taf. I.
1863. SARS, G. O. Beretning om en i Sommeren 1862 foretagen zoologisk Reise i Christianias og Trondhjems Stifter; Nyt Mag. f. Naturvid. Bd. 12, p. 193—252.
1864. — Beretning om en i Sommeren 1863 foretagen zoologisk Reise i Christiania Stift; ibidem Bd. 13, p. 225—260.
1868. — Beretning om en i Sommeren 1865 foretagen zoologisk Reise ved Kysterne of Christianias og Christiansands Stifter; ibidem. Bd. 15, p. 84—128.

1869. SARS, G. O. Undersøgelser over Christianiafjordens Dybvandsfauna; ibidem, Bd. 16, p. 305—362.
1870. — Nye Dybvandskrustaceer fra Lofoten; Forh. Vid. Selsk. Christiania Aar 1869, p. 147—174.
- 1870, 72, 79. — Carcinologiske Bidrag til Norgés Fauna. I. Monographie over de ved Norges Kyster forekommende Mysider, Heft. 1, 2, 3.
1877. — Nye Bidrag til Kundskaben om Middelhavets Invertebratfauna; I. Middelhavets Mysider; Arch. Math. Naturvidensk. Bd. II. p. 10—119, tab. 1—36.
1877. — Prodrömus descriptionis crustaceorum et pycnogonidarum, quæ in expeditione norvegica anno 1876 observavit —; ibidem p. 337—371.
1879. — Crustacea et Pycnogonida nova in itinere 2:do et 3:tio expeditionis Norvegicæ anno 1877 & 78 collecta. (Prodrömus descriptionis); ibidem. Bd. IV. p. 425—476.
1883. — Oversigt af Norges Crustaceer med foreløbige Bemærkninger over de nye eller mindre bekendte Arter; Forh. Vid. Selsk. Christiania Aar 1882, p. 1—124, tab. I—VI.
1884. — Preliminary Notices on the Schizopoda of H. M. S. »Challenger» Expedition; ibidem Aar 1883, p. 1—43.
1885. — Crustacea I. II. Den Norske Nordhavsexpedition. The Norwegian North-Atlantic Expedition. Vol. VI. Zoology. p. 1—280, pl. 1—21, p. 1—96.
1885. — Schizopoda; Rep. Sci. Results Challenger. Zoology. Vol. XIII.
1890. — Bidrag til Kundskaben om Decapodernes Forvandlinger. III. Fam. Crangonidæ; Arch. Math. Naturvidensk. Bd. XVI. p. 132—195, pl. I—VI.
1900. — Crustacea; The Norwegian North Polar Expedition 1893—1896. Scientific Results. Vol. I. pl. 5 p. 1—141, pl. I—XXXVI.
1857. SARS, M. Om 3 nye norske Krebsdyr; Forhandl. Skand. Naturforsk. syvende Møde i Christiania 1856, p. 160—175.
1861. — Beretning om en i Sommeren 1859 foretagen zoologisk Reise ved Kysten af Romsdals Amt; Nyt Mag. f. Naturvid. Bd. 11, p. 241—263.
1862. — Bemærkninger om Crangoninerne med Beskrivelse over to nye norske Arter; Forh. Vid. Selsk. Christiania Aar 1861, p. 179—187.
1864. — Forelagde en udförlig Beskrivelse over den af ham i Aaret 1856 opstillede Thysanopoda norvegica; ibidem, Aar 1863, p. 2—10.
1864. — Gav nogle Tillæg til sine i et foregaaende Møde meddelte Iagttagelser over de mærkværdige, paa Bugsiden af Thysanopoda beliggende Sandseredskaber,

- og anmeldte ved samme Leilighed Opdagelsen af to nye norske Arter af denne Krebsdyrslægt; ibidem, p. 79—84.
1868. SARS, M. Bidrag til Kundskab om Christianiafjordens Fauna; Nyt Mag. f. Naturvid. Bd. 15, p. 240—344, tab. I—VII.
1899. SCOTT, TH. Report on the Marine and Freshwater Crustacea from Franz-Josef Land, collected by Mr WILLIAM S. BRUCE, of the Jackson-Harmsworth Expedition; Journ. Linn. Soc. London. Zool. Vol. XXVII, p. 60—126, pl. 3—9.
- 1878(—82) SMITH, S. I. The Stalk-eyed Crustaceans of the Atlantic Coast of North America north of Cape Cod; Trans. Connect. Acad. Arts and Sci. Vol. V. Pt. I. p. 27—136. pl. VIII—XII.
- 1882—83. — Report on the Crustacea. Pt. I. Decapoda; Reports on the Results of Dredging, under the Supervision of ALEXANDER AGASSIZ, on the East Coast of the United States, during the Summer of 1880, by the U. S. Coast Survey Steamer »Blake», Commander J. R. BARTLETT, U. S. N., Commanding; Bull. Mus. Comp. Zool. Harvard College, Cambridge, Vol. X. n:o 1, p. 1—108, pl. I—XVI.
1884. — List of the Crustacea dredged on the coast of Labrador by the expedition under the direction of W. A. STEARNS, in 1882; Proc. U. S. Nat. Museum. Vol. VI. 1883, p. 218—222.
1884. — Review of the Marine Crustacea of Labrador; ibidem, p. 223—232.
1885. — On some new or little known Decapod Crustacea, from recent Fish Commission dredgings off the East coast of the United States; ibidem, Vol. VII. 1884, p. 493—511.
1884. SPARRE SCHNEIDER, J. Undersøgelser af dyrlivet i de arktiske fjorde II. Kvænangsfjordens Crustaceer og Pycnogonider; Tromsø Museums Aarshefter, VII. p. 47—134, pl. I—V.
1888. SPENCE BATE, C. Crustacea Macrura; Rep. Sci. Results Challenger. Zoology. Vol. XXIV.
1893. STEBBING, TH. R. R. A History of Crustacea, Recent Malacostraca; The International Scientific Series, Vol. LXXIV.
1900. — Arctic Crustacea: Bruce Collection; Ann. Mag. Nat. Hist. 7, Vol. V. p. 1—16.
1882. STUXBERG, A. Evertebratfaunan i Sibiriens ishaf; Vega-Expeditionens Vetenskapl. Iaktagelser, Bd. I. p. 677—812, taf. 15.
1887. — Faunan på och kring Novaja Semlja; ibidem, Bd. V. p. 1—239.

1897. VANHÖFFEN, E. Die Fauna und Flora Grönlands; Grönlands-Expedition der Gesellschaft für Erdkunde zu Berlin 1891—1893. Unter Leitung von ERICH VON DRYGALSKI.

Decapoda.

Brachyura.

Tribe Oxyrhyncha.

Fam. Maiidæ.

Hyas LEACH 1813.

1. *Hyas araneus* (LINNÉ).

1758. *Cancer Araneus* LINNÉ, Syst. Naturæ, Ed. X. I. p. 628.
 1780. » » O. FABRICIUS, Fauna Groenl. p. 233, n:o 213.
 1853. *Hyas araneus*, BELL, Hist. Brit. Stalk-eyed Crust. p. 31.
 1882. » *coarctatus* var., HOEK, Crust. »Willem Barents». l. c. p. 3., Taf. I. Fig. 1.
 1887. » *araneus* HANSEN, Dijnphna-Togtets zool. bot. Udbytte etc., l. c. p. 234.
 1893. *Hyas araneus* RATHBUN, Catalogue of the Crabs of the Family Maiidæ etc. l. c. p. 67.
 1894. *Hyas araneus*, A. MILNE EDWARDS et BOUVIER, Brachyures et Anomures l. c. p. 18.
 1897. » » Var. *hoekii* Birula, Essai d'une faune des crustacés décapodes etc. l. c. p. 442.
 1900. » » STEBBING, Arctic Crust. l. c. p. 2.

Localities:

in 1898:

- stat. 3. lat. 74° 21' N., long. 19° 15' E., Beeren Eisland, depth 20 m., bottom temp. + 1,5 C., pebbles, Laminariæ and red algæ, 15/VI one young spec.

- stat. 4. lat. 74° 21' N., long. 19° 15' E., Beeren Island, »South Harbour», depth 14—18 m., rocky bottom with algæ, pebbles, and sand. 17/VI, »common, grayish-brown, colour varying as to the bottom».
- » 5. lat. 75° 49' N., long. 24° 25' E., between Beeren Island and Hope Island, depth 80 m., bottom temp. — 1,42°, rocky bottom, 21/VI, several spec.
- » 16. Recherche Bay, between Reindeer Point and Fox Glacier, West Spitzbergen, depth 90 m., rocky bottom with soft, grayish-blue clay, 8/VII, one small spec.
- » 17. Recherche Bay, the anchorage, depth 0 — 20 m., stony bottom, 13/VII, one spec.

in 1899:

Tromsø, depth 60—70 m., 22/VI, several spec., WULFF.

This well-known species has a very wide distribution in the North Atlantic and Arctic Oceans. It has been obtained at the following places: in the North Sea off the coasts of England, Denmark and Scandinavia, off Belgium and France, off the Murman coast; in the Barents Sea, in the Kara Sea, off Beeren Island and Spitzbergen, off Iceland and West Greenland as far north as Godhavn, off the coasts of New Foundland and New England as far south as Cape Cod. According to Brandt, it occurs also in the Sea of Ochotsk; but it is still undecided if the specimens recorded by that author are quite identical with the typical North Atlantic species.¹ It also depends on the settlement of this question as to whether we are to regard it as circumpolar or not. Its main distribution seems to be the North Atlantic where it occurs both on the European and the American side, and goes into the Arctic as far north as Spitzbergen and Godhavn, and southwards to Belgium and the Atlantic coasts of France.

It lives in shallow water, although sometimes occurring in depths of 100 fathoms or more.

As to the identity of this and the next species, I refer the reader to STEBBING, Arctic Crustacea, l. c. p. 2—4, where he will find an historical review of the different opinions. I am unable here, for want of material, to enter on a discussion of the subject; but I must content myself with remarking that

¹ According to STIMPSON in RATHBUN, l. c. p. 97, not one of *Hyas araneus* out of several hundred specimens of *Hyas latifrons* was found in a collection from the Sea of Ochotsk and Kamtschatka.

my specimens of *Hyas coarctatus* from the harbour of Tromsø, some of which were egg-carrying females (although of a remarkably small size) present the typical appearance and are, at the very first glance, to be distinguished from specimens of *Hyas araneus*.

Length of carapace of largest spec.: 50 mm., breadth 38 mm.

2. *Hyas coarctatus* LEACH.

1815. *Hyas coarctatus* LEACH, A tabular view etc., l. c. p. 329.
 1853. » » BELL, Hist. Brit. Stalk-eyed Crust. p. 35.
 1879. » » SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 43.
 1893. » » RATHBUN, Catalogue of the Crabs of the Family Maiidae etc. l. c. p. 69.
 1893. » » A. MILNE EDWARDS et BOUVIER, Brachyures Anomures, l. c. p. 19.
 1897. » coarctata BIRULA, Essai d'une faune des crustacés décapodes etc., l. c. p. 445.

Localities:

in 1899:

Tromsø depth 60—70 m., 22/VI several spec., WULFF.

Distribution: This species occurs in the same tracts of the ocean as the preceding species, viz. the North Atlantic and Arctic. Therefore, it is superfluous to reiterate the localities where it has been observed. It goes southwards on the European side of the Atlantic to the British Channel, and, on the American side, to the coasts of New Jersey and Long Island. It has not yet been obtained off Spitzbergen or East Greenland. It goes on the west coast of Greenland as far north as Waigat and Hare Island. STIMPSON has reported it from the Behring Sea, and BRANDT from the Sea of Ochotsk, the latter distinguishing it by the name of »var. *alutacea*«. STIMPSON subsequently describes a new species, viz. *Hyas latifrons* from the Behring Sea. SMITH suspects that he used, for the description of this species, specimens referred by him, a few months previously, to *Hyas coarctatus*.

That species, according to SMITH, seems to be distinct from the North Atlantic *Hyas coarctatus*; but RATHBUN, who has examined a great number of specimens, takes an opposite

view. How far BRANDT's variety *alutacea* ought to be considered a variety or distinct species, is a matter that must be left to a future revision of the whole genus to decide. Another species, viz. *Hyas lyratus* Dana, occurs from the Aleutian Islands and the Pacific coast of North America southwards to Puget Sound. This species seems to be a very distinct one.

Hyas coarctatus occurs in depths from a few (5) up to more than hundred fathoms.

Length of carapace of largest spec. 24 mm.
breadth » » » 16 mm.

Anomura.

Tribe Pterygura.

Fam. Paguridæ.

Eupagurus BRANDT 1851.

3. Eupagurus pubescens (KRÖYER).

1838. Pagurus pubescens KRÖYER, Grøn. Amfip. l. c. p. 314.
1838—39. » » idem, Consp. Crust. Groenl. l. c. p. 251.
1846 (?). » » idem. Voy. en Scand. etc., Pl. II.
Fig. 1, a—n.
1851. » (Eupagurus) pubescens BRANDT, Middendorff's
Sibir. Reise l. p. c. 111.
1882. » pubescens HOEK, Crust. » Willem Barents » l. c.
p. 6.
1897. Eupagurus pubescens BIRULA, Essai d'une faune des cru-
stacés décapodes etc. l. c. p. 437.
1900. » » STEBBING, Arctic. Crust. l. c. p. 5.

Localities:

in 1898:

- stat. 3. lat. 74° 21' N., long. 19° 15' E., Beeren Island, depth 20 m.,
bottom temp. $\pm 1.5^{\circ}$ C., pebbles, Laminariæ and red algæ,
15/VI, one spec.

- stat. 5. lat. 75° 49' N., long. 24° 25' E., between Beeren Island and Hope Island, depth 80 m., bottom temp. — 1.42° C., rocky bottom, 21/VI, six spec.
- » 12. Recherche Bay near to Fox Glacier, West Spitzbergen, depth 90 m., stony bottom, 4/VII, one spec.
 - » 13. Recherche Bay, off Fox Glacier, depth 75 m., stony bottom with dead shells and soft grayish-blue clay, 5/VII, six spec.
 - » 16. Recherche Bay, between Reindeer Point and Fox Glacier, depth 90 m., rocky bottom with soft gray-bluish clay, 8/VII, two spec.
 - » 17. Recherche Bay, the anchorage, depth 0—20 m., stony bottom, 13/VII, three spec.
 - » 23. lat. 78° 15' N., long. 13° 55' E., Ice Fjord, Safe Harbour, depth 50—90 m., soft grayish mud, 23/VII, one spec.
 - » 38. lat. 79° 47' N., long. 14° 28' E., entrance of Liefde Bay, depth 140 m., stony bottom with red algæ, 25/VIII, one spec.
 - » 39. lat. 79° 43' N., long. 10° 52' E., Danish Island, »Virgo's» harbour, depth 25—30 m., gray mud, Laminariæ, 27/VIII, two spec.
 - » 41. lat. 75° 58' N., long. 13° 18' E., 56 miles S. W. of South Cape, Spitzbergen, depth 350 m., bottom temp. + 2.73° C., grayish clay, 1/IX, one spec.

in 1899:

Tromsø, depth 60—70 m., 22/VI, many spec. WULFF.

West Spitzbergen, Green Harbour, depth 110 m., 30/VI, three spec., WULFF.

North Spitzbergen, Danes Gat, depth 20—30 m., 7/VII, one spec. WULFF.

in 1900:

- stat. 1. West Spitzbergen, Ice Fjord, Coal Bay depth 50 m., stony bottom with dead shells, 16/VI—20/VI, det. LÖNNBERG.
- » 8. West Spitzbergen, Kings Bay, depth 10—30 m., pebbles and sand with Laminariæ, 29/VI, det. LÖNNBERG.

This species seems to be subjected to very great variations as to the degree of the pubescence and to the form of the left chelæ which has produced an almost inextricable confusion in the synonymy.¹ As I have examined specimens only from Spitzbergen and Tromsø, which closely agree with the type as figured by KRÖYER, I am of course not able

¹ To this has also, without doubt, contributed that KRÖYER in his descriptions has, by a *lapsus calami*, as to the chelæ written »dextræ» instead of »sinistræ», as BRANDT was the first to suspect.

here to enter on a critical discussion as to how far *Pagurus Thompsoni* Bell, *Eupagurus Krøyeri* STIMPSON,¹ or some species from Alaska recently described by BENEDICT² as new species, *Eupagurus capillatus*, *Eupagurus brandti* or *Eupagurus dalli* are entitled to a specific rank. The distinctions between all these forms seem to me to be of doubtful value, and the whole genus is, certainly very much in need of a thorough revision. I therefore, restrict myself here to what is said by STEBBING in »Arctic Crustacea etc.» l. c. p. 5. and by DOFLEIN in »Dekap. Krebse arkt. Meere», l. c. p. 341.

From this uncertainty, it is consequently very difficult to get an exact information as to the geographical distribution. In its wider sense the species must be regarded as Arctic and circumpolar. It has been obtained at most places in the arctic region as far as I have been able to find out in the literature. It is, however, not recorded as yet from the Siberian Polar Sea, Franz Joseph Land, or the Kara Sea. Nor does it seem to occur on East Greenland, and, as to its occurrence in the Polar Archipelago of North American, we have no information. It has also not been taken in Smith Sound, and this fact, in connection with its non-occurrence in the above mentioned regions seems to indicate that it does not belong to the Polar basin. The most southern places where it has been obtained are as follows: Bohuslän (Sweden), Kattegat, England, New Jersey, in lat. 40° N., long. 73° W., and Puget Sound.³

In my collections there are several large specimens, and it seemed to thrive especially in Recherche Bay, West Spitzbergen. I have one specimen before me from that locality, which measures:

length of carapace	25 mm.
» » righth hand	45 »
» » left »	34 »

The specimens collected by Mr. WULFF in Tromsø are of a much smaller size.

¹ *Eupagurus trigonocheirus* STIMPSON.

² BENEDICT, Thirty-seven new species etc. l. c. p. 8.

³ Its vertical distribution is from several fathoms up to 100 or more. In regard to two finds of this in 140 and 290 fathoms resp. HANSEN is somewhat dubious as to the exactness of these depths.

Length of largest specimen from this locality:

»	»	carapace	16 mm.
»	»	right hand	35 »
»	»	left »	20 »

Anapagurus HENDERSON 1886.

4. Anapagurus lævis (THOMPSON).

1843. *Pagurus lævis* THOMPSON, Report on the fauna of Ireland, Invertebrate; Rep. Brit. Assoc. Adv. Sci. 13:th meeting.
 1853. » » BELL, Hist. Brit. Stalk-eyed Crust. p. 184.
 1894. *Anapagurus lævis*, A. MILNE-EDWARDS et BOUVIER, Brachyures et Anomures, l. c. p. 72, Pl. XI, Figg. 16—28.

Locality:

in 1899:

- stat. 1. lat. 61° 16' N, 1° 18' E., depth 150 m., sand, some stones and dead shells. 31/V, two spec.

This species was first described by THOMPSON as *Pagurus lævis*, but it was in 1886 referred by HENDERSON to the genus *Anapagurus*, mainly characterized by the form of the male appendix on the fifth left leg, it being here short and curved, instead of spirally twisted, as in *Spiropagurus* STIMPSON. Besides this species, easily distinguishable by a red mark running along the whole length of the hand and continuing to the fingers, HENDERSON includes in this genus four other species from the North Sea, the Tropical part of North Atlantic, and Australia.

Distribution: West Coast of Norway, British Isles, Mediterranean, six stations of the campaigns of 1886 and 1887 (Prince of Monaco), Azores (Prince of Monaco). It is a Pagurid which seems to live in a moderate depth varying between 100 and 200 m.

Length of carapace (of a male) 9 mm.

»	»	right hand	15 »
»	»	left	7 »

Macrura.

Fam. Crangonidæ.

Sclerocrangon Sars 1882.

In his 'Oversigt af Norges Crustaceer med foreløbige Bemærkninger over de nye eller mindre bekendte Arter' l. c. 1882 Sars instituted a new genus to receive this Arctic species *Crangon boreas* known more than a century ago. He afterwards gave, in the Norwegian North Atlantic Expedition, a generic diagnosis. In the genus he also included a new species obtained during the said expedition, and with some hesitation, *Crangon cataphractus* Olivi, from the Mediterranean. Later on, he added to the genus *Cheraphilus Agassizii* SMITH, from the Eastern coast of United States, and, in 1895, it was enlarged by ORTMANN¹ with the following species: *Crangon atrox* Faxon,² from Western coast of Mexico, *Crangon sharpi* n. sp. from Alaska, *Crangon procax* Faxon, from Western coast of Central America, *Crangon intermedius* STIMPSON, from Bering Sea and Alaska, *Crangon angusticauda* de HAAN, from Japan, *Crangon munitus* DANA, from Puget Sound and Lower California.³ Besides the true *Crangon salebrosus* OWEN, the genus *Sclerocrangon* would thus include no less than eleven species, seven of which belonging to the North Pacific, three to the North Atlantic, and one to the Mediterranean.

5. *Sclerocrangon boreas* (PHIPPS).

1774. Cancer Boreas PHIPPS, Voyage towards the North Pole, p. 190, Tab. XII, Fig. 1.
1842—43. Crangon , KRÖYER, De hidtil bekj. nord. Krongon- Art. l. c. p. 218, Tab. IV, Fig. 1—14.

¹ It may be remarked that this author regards it as a subgenus of *Crangon*.

² Faxon, Prelim. Descript. New Spec. Crust. l. c. p. 199.

³ ORTMANN, Study Syst. Geogr. Distrib. Crangonidæ l. c. p. 177.

1874. *Crangon boreas* BUCHHOLZ, Crust. Zweite Deutsche Nordpolarfahrt, l. c. p. 271.
 1882. *Cheraphilus boreas* HOEK, Crust. »Willem Barents» l. c. p. 10.
 1886. *Sclerocrangon* » KOELBEL, Crust. Pycnog. und Arachn. von Jan Mayen, l. c. p. 51.
 1897. » » BIRULA, Essai d'une faune des crustacés décapodes etc., l. c. p. 431. Tab. XX. Fig. 8.

Localities:

in 1898:

- stat. 13. West Spitzbergen, Recherche Bay, off Fox Glacier, depth 75 m., stony bottom with dead shells and soft grayish-blue clay, 5/VII, four spec.
 » 16. Recherche Bay, between Reindeer Point and Fox Glacier, depth 90 m., rocky bottom with soft grayish-blue clay, 8/VII, four spec.
 » 17. Recherche Bay, the anchorage, depth 0—20 m., stony bottom, 13/VII, numerous spec.
 » 20. West Spitzbergen, Ice Fiord, North Fiord, off Cape Wærn, depth 36 m., boulders, Lithothamnium, with soft red-brownish clay, 19/VII, two spec.
 » 22. lat. 78° 22' N., long. 14° 53' E., Ice Fiord, off Cape Bohe-man, depth 40—50 m., 21/VII, four spec.
 » 30. King Charles' Land, Swedish Foreland, depth 10—16 m., blackish-gray sand, stones, mud, and algæ. 6/VIII, four spec.
 » 38. lat. 79° 47' N., long. 14° 28' E., entrance of Liefde Bay, depth 140 m., stony bottom with red algæ, 25/VIII, five spec.
 » 39. lat. 79° 43' N., long. 10° 52' E., Danes Island, Virgo's harbour, depth 25—30 m., gray mud, Laminariæ, 27/VIII, several spec.

in 1899:

- stat. 21. lat. 74° 10' N., long. 20° 8' W., S. E. of Clavering Island, depth 25—40 m., mud with dead shells and pebbles, 17/VII, one spec.
 West Spitzbergen, Green Harbour, depth 110 m., 30/VI, five spec., WULFF.
 North Spitzbergen, Danes Gat depth 20—30 m., 7/VII, several spec. WULFF.
 North Spitzbergen, Treurenberg Bay, depth 10—20 m., 10/VIII, four spec., WULFF.

in 1900:

- stat. 1. West Spitzbergen, Ice Fiord, Coal Bay, depth 50 m., stony bottom with dead shells, 16/VI—20/VI, det. LÖNNBERG.
 » 2. ibidem, depth 100 m., rocks, 16/VI—20/VI, det. LÖNNBERG.
 » 3. ibidem, depth 50—100 m., stones, 22/VI, det. LÖNNBERG.

- stat. 11. lat. 79° 20' N., long. 10° E., W. of Spitzbergen, depth 100 m., stones, 5/VII, det. LÖNNBERG.
 » 12. ibidem, depth 60 m., rocks, 5/VII, det. LÖNNBERG.

This species is one of the most common decapods in the Arctic Ocean, where it lives mainly in shallow water from a few up to 100 fathoms. In greater depths it very seldom occurs, although, in HANSEN's catalogue of West Greenlandian Malacostraca, it is said once to have been obtained off Jakobshavn, at a depth of 200 fathoms. The author, however, points out, that he has never seen a single specimen from the numerous Swedish dredgings from a depth of 100—400 fathoms — which seems to prove that the species, at least as a rule, does not live in depths even slightly exceeding 100 fathoms.

Its horizontal distribution is very extensive within the Arctic Circle. I content myself with remarking that it has been recorded from almost every coast. On the Eastern coast of North America it goes as far south as Massachusetts Bay and right along the coast of Norway to Lofoten Island.

As to the strange fact that it has not as yet been obtained in the Kara Sea either by the Danish »Dijmphna» Expedition or by the Swedish expeditions, and that it seems to be very rare E. of Spitzbergen and off East Greenland, I refer to what is said farther on under the next species. Although BRANDT¹ says that »das Museum besitzt = = = mehrere vom Hrn v. BAER im Eismeere gesammelte Individuen = =», it is somewhat surprising to find that STUXBERG does not mention it as occurring along the Siberian coast except very far east. HANSEN remarks also that these statements as well as STIMPSON's notice that it occurs »along the whole coast of North America to Bering Straits» must be — *ad interim* — considered as somewhat doubtful, because, possibly, some confusion with *Sclerocrangon salebrosus* taken at Kamtschatka may exist as to some of these dates. I, therefore, think that its generally accepted circumpolarity must be proved by further investigation in the Siberian Polar Sea, as well as in the North American Archipelago.

¹ MIDDENDORFF's Sibir. Reise I. c. p. 114.

Length of greatest spec. (from stat. 38, 1898) 90 mm.

Sclerocrangon boreas is sometimes very much infested by an ectoparasitic *Piscicolid*.

***Sclerocrangon ferox* (G. O. SARS).**

1877. *Cheraphilus ferox* G. O. SARS, *Prodromus descriptionis* etc., l. c. p. 339.
 1882. " " HOEK, *Crust. »Willem Barents»*, l. c. p. 9, Taf. I, Fig. 3.
 1885. *Sclerocrangon salebrosus* G. O. SARS, *Norske Nordhavsexp.* I, p. 15, pl. 2.
 1886. " " KOEHLBEL, *Crust. Pycnog. und Arachn.* JAN MAYEN, l. c. p. 51, taf. IV, fig. 1—12.
 1887. " *ferox* HANSEN, *Dijmphna-Togtet zool. bot. Udbytte*, p. 236.
 1897. " " BIRULA, *Essai d'une faune des crustacés décapodes* etc., l. c. p. 432, Tab. XX, Fig. 9.
 1900. " " STEBBING, *Arctic Crust.* l. c. p. 7.
 1900. *Crangon (Sclerocrangon) salebrosus* DOFLEIN, *Dekap. Krebse arkt. Meere*, l. c. p. 323.

Localities:

in 1898:

- stat. 7. lat. 77° 25' N., long. 27° 30' E., N. of Hope Island, depth 160 m., bottom temp. — 1,71° C., yellowish-brown clay, 23/VI, four spec.
 » 37. lat. 81° 14' N., long. 22° 50' E., N.E. of Seven Islands, depth 150 m., bottom temp. + 2° C., gray clay, 20/VIII, five spec.
 » 40. lat. 79° 58' N., long. 9° 30' E., 19—20 miles N.W. of Danes Island, depth 435 m., bottom temp. + 1,6° C., gray clay, stones, 27/VIII, one spec.

in 1899:

- stat. 2. lat. 62° 15' N., long. 0° 37' E., depth 670 m., mud with pebbles, 1/VI, one spec.
 Off Kaiser Franz Joseph Fiord, in the oesophagus of *Phoca barbata*. 22/VII, one spec.
 stat. 27. lat. 71° 35' N., long. 21° 10' W., depth 260 m., stones, and mud, 27/VII, one spec.
 » 37. lat. 73° 2' N., long. 24° 30' W., King Oscar Fiord, depth 180—215 m., mud, much pebbles and stones, one spec.
 » 43. lat. 73° 32' N., long. 24° 38' W., Kaiser Franz Joseph Fiord, Cape Weber, depth 100—119 m., mud with pebbles and stones, 28/VIII, one spec.

in 1900:

- stat. 16. lat. 72° 25' N., long. 17° 56' W., E. of Greenland, depth 300 m., pebbles and sand, 30/VII, det. LÖNNBERG
- » 25. the entrance of Kaiser Franz Joseph Fiord, depth 200—300 m., mud, 14/VIII, det. LÖNNBERG.
- » 27. Kaiser Franz Joseph Fiord, Muskox Fiord, depth 220 m., clay, 21/VIII, det. LÖNNBERG.

This magnificent species was first described by SARS in 1877 as *Cheraphilus ferox* and, a few years later, under the same name by HOEK. Then, a full description was given by SARS in the Crustacea of the Norwegian North Atlantic Expedition, but, unfortunately, he identified it with *Crangon salebrosus* OWEN described in BEECHY's Voyage. HANSEN, in his »Oversigt over de paa Dijnphna-Togtet indsamlede Krebsdyr», has, however, with full evidence shown that OWENS *Crangon salebrosus* is quite another species. Both in regard to the form of the rostrum and the sculpture of the carapace, it exhibits no resemblance at all.¹ As far as I know, ORTMANN and DOFLEIN are the only ones amongst subsequent writers who have not accepted HANSEN's alteration of the nomenclature; but, as to the last author, it is not surprising at all, as he did not use either »Malacostraca marina Groenlandiæ occidentalis» or the work cited a few lines above, next KRÖYER's and SARS' works undoubtedly the most important ones with regard to Arctic crustaceans. He contents himself in »Zusätze und Berichtigungen» to cite their titles.

The species has been taken at several stations in the Arctic Ocean. It was obtained, during the Norwegian North Atlantic Expedition, at six stations, four of which were situated in the sea round Spitzbergen, one off JAN MAYEN, and one off the West coast of Norway. On the cruises of »Willem Barents» it was found at five stations in Barents Sea.

It was dredged in the Kara Sea at two stations during NORDENSKIÖLD'S voyages, and at no less than twenty on the »Dijnpha» Expedition. KOELBEL enumerates it from JAN MAYEN, and HANSEN from four places off West Greenland. It is mentioned by BIRULA from the Murman Coast, and by STEBBING from three stations in Barents Sea. One specimens was

¹ In 1890 SARS himself corrected his error in naming it *Sclerocrangon ferox*.

obtained by the »Helgoland» Expedition »in der Nansenrinne» in lat. 81° 20' N., long. 19° E., and another one by »Olga» between South Spitzbergen and Hope Island. Besides the stations enumerated above, where it was dredged during the last three Swedish Arctic Expeditions, these are, as far as I have been able to find in the literature, the only certain localities hitherto recorded of its distribution. STUXBERG states that it does not occur E. of the Kara Sea, and the finds of it off Kamtschatka and in the Bering Straits are already shown to have arisen from some confusion with *Crangon salebrosus* OWEN.

It is worth while remarking its singular distribution in the Spitzbergian and Greenlandian Seas. It has not as yet been obtained on the West Spitzbergen, but it seems to be rather abundant farther east, in the Barents and Kara Seas.; while in these seas, *Sclerocrangon boreas*, which is so abundant off West Spitzbergen, becomes rather scarce here. The same we might state with regard to East Greenland. Although BUCHHOLZ says that *Sclerocrangon boreas* »gehört daselbst ebenfalls zu den sehr häufig vorkommenden Formen», it must be pointed out that, during the Swedish Expeditions of 1899 and 1900, this species was only dredged at one station, and was represented by a single specimen, while *Sclerocrangon ferox* was obtained at no less than seven stations in several specimens. Moreover, *Sclerocrangon boreas* is by far, next to *Hippolyte polaris*, perhaps the most common decapod on both sides off Baffin Bay, as HANSEN and I myself can testify; while the other species, as mentioned above, have been hitherto obtained in those seas only at four stations and in a small number of individuals.

Thus it seems as if they do not like living together, but substitute each other. It has often been remarked that *Sclerocrangon boreas* lives in more shallow water, while *Sclerocrangon ferox* is an inhabitant of the deep-sea, and that theory may partly hold good. Nevertheless, it does not fully explain its singular distribution; for, in the shallow seas E. of Spitzbergen, *Sclerocrangon ferox* is very common, and, on the other hand, *Sclerocrangon boreas* has been taken at a depth of 200 fathoms.

I think, therefore, that we must look for the explanation in the temperature of the water. As a rule the bottom

temperature of the water in the seas E. of Spitzbergen and of East Greenland is more or less about zero, varying somewhat from $+2^{\circ}$ C., to -1.5° C. and the same, I think, will be proved to be the case off East Greenland, when the hydrographical observations made during the Swedish Expeditions have been summarized. This temperature corresponds, on the whole, very well with those in the greater depths of the ocean. Only in water of that temperature *Sclerocrangon ferox* has been found, while the type species seems to live in water of somewhat higher temperature. I fully admit, however, that this does not afford a quite satisfactory explanation, for it will be difficult to account for that in Smith Sound, for instance, where a strong Arctic current runs southwards, *Sclerocrangon boreas* is rather abundant, while the other one is wanting.

The greatest depth from which this species has been dredged is, I believe, 1000 m. (station north of Spitzbergen, Helgoland Expedition).

Sclerocrangon ferox rivals preceding species also in regard to size.

Length of the greatest spec. (from stat. 37, 1899) 121 mm.

Crangon FABRICIUS 1798.

7. Crangon Allmanni KINAHAN.

- ? Crangon Allmanni KINAHAN, Proc. Nat. Hist. Soc., Dublin, Vol. II (cited after KINAHAN).
 1862. » (Steiracrangon) Allmanni idem, On the Brit. Spec. of Crangon and Galathea etc., l. c. p. 65, pl. III.
 1890. » Allmanni G. O. SARS, Decapodernes Forvandlinger, l. c. p. 135, tab I, fig. 29—31.
 1897. » Allmanni BIRULA, Essai d'une faune des crustacés décapodes etc., l. c. p. 430, tab. XX, fig. 5.
 1900. » allmanni DÖFLEIN, Dekap. Krebse arkt. Meere, l. c. p. 326.

Locality:

in 1899.

stat. 1. lat. $61^{\circ} 16'$ N., long. $1^{\circ} 18'$ E., depth 150 m., sand, some stones and dead shells, 31/V, seven spec.

This form, which is easily distinguishable by the groove on the sixth segment of pleon, was first described by KINAHAN as a distinct species. It has proved impossible for me to get the first paper in which it is named by that author, so that I am, consequently, not able to give an exact reference here. I must, therefore, quote it after KINAHAN later and, as I believe, more extensive memoir »On the Britannic Species of Crangon and Galathea; with some Remarks on the Homologies of these Groups».

There have been many disputes as to the specific value of this form, and, in fact, the difference between it and the common *Crangon vulgaris* (LINNÉ) does not seem to be very great. But since SARS has published his remarkable observations on the development of these species, we cannot any longer have any doubts as to their specific difference. The great carcinologist traced the development of both species which is, on the whole, more or less the same. He could, however, very easily distinguish the species on whatever stage by two very striking characteristics. In the larvas of *Crangon vulgaris* the third segment of the pleon is provided with a strong dorsal spine directed at the rear which is quite wanting in those of *Crangon Allmanni*. Besides that the lateral spines on the fifth segment of pleon in the former species are comparatively much larger than those in *Cr. Allmanni* the larvas of which are, on the whole, larger and more slender than those of *Cr. vulgaris*.

This species seems to belong to the European side of the North Atlantic. It was observed for the first time by KINAHAN at Dublin whence he established the species in 1850. Later on, it has been obtained at several places in the North Sea, Skagerack, Kattegat, and the Sound, along the coast of Norway where it occurs not infrequently as far east as to the Murman Coast and the entrance to the White Sea. During the Norwegian North Atlantic Expedition it was also taken in the harbour of Reykiavik, Iceland. It lives in moderate depths, 20—30 fathoms. METZGER obtained it once from 69 fathoms,¹ and my specimens were dredged from 150 m. which, I think, are the greatest depths hitherto

¹ l. c. p. 290.

recorded for its vertical range. It prefers, for the most part, to live in the sand or »Schlick».

Length of largest spec. (a female with roe) 51 mm.

The eggs are very small and numerous.

***Cheraphilus* KINAHAN 1862.**

8. *Cheraphilus echinulatus* (M. SARS).

1862. *Crangon echinulatus* M. SARS, Bemærkn. over Crangoninerne, l. c. p. 186.
 1868. » » idem, Bidrag till Kundskab etc., l. c. p. 269, Tab. III, Figg. 48—64.
 1882. *Cheraphilus echinulatus* G. O. SARS, Overs. Norges Crustaceer etc., l. c. p. 44.
 1890. » » G. O. SARS, Dekapodernes Forvandlinger, III. l. c. p. 147, pl. II, fig. 1—21.

Locality:

in 1899:

- stat. 1. lat. 61° 16' N., long. 1° 18' E., depth 150 m., sand, some stones and dead shells, 31/V, one spec.

This species belongs, according to SARS, to KINAHAN'S genus *Cheraphilus* s. str. Two other Norwegian species are included by the same author in this genus, viz. *Cheraphilus nanus* (KRÖYER) and *Cheraphilus neglectus* (G. O. SARS). None of these is represented in the collections of the last Swedish Arctic Expeditions.

Cheraphilus echinulatus, with which, according to SARS, *Crangon serratus* NORMAN is identical, has hitherto been obtained only in the North Sea, off the Western and Southern coasts of Norway and off the coasts of Scotland. It seems to be very rare, and it lives at considerable depths, 50—70 fathoms or more.

Length 27 mm. According to M. SARS, the largest females attain a length of 37 mm.

***Pontophilus* LEACH 1817.**

***Pontophilus norvegicus* M. SARS.**

1861. *Crangon norvegicus* M. SARS, Beretn. om en i 1859 foretagen zool. Reise etc., l. c. p. 248.

1862. *Pontophilus norvegicus* M. SARS, Bemærkn. over Crangoninerne etc., l. c. p. 183.
 1864. Crangon (*Pontophilus*) *norvegicus* Goës, Crust. decap. mar. Sueciæ., l. c. p. 173.
 1868. *Pontophilus norvegicus* idem, Bidrag til Kundskab etc., l. c. p. 242, Tab. I, Figg. 1—25, Tab. II, Fig. 17—37.
 1869. » » G. O. SARS, Undersøg. over Christianiafjordens Dybvandsfauna, l. c. p. 321.
 1890. » » G. O. SARS, Dekapodernas Forvandlinger, III, l. c. p. 153, pl. IV.

Localities:

1898:

- stat. 41. lat. 75° 58' N., long. 13° 18' E., 56 miles S.W. of South Cape, Spitzbergen, depth 350 m., bottom temp. + 2,73° C., grayish clay, 1/IX, one spec.
 » 42. lat. 73° 3' N., long. 18° 30' E., between Beeren Island and Norway, depth 410 m., bottom temp. + 2° C., gray clay, 4/IX, five spec.

This species was first shortly described by M. SARS in 1861 on specimens from some places of the Western and Southern fjords of Norway and, seven years later, fully re-described by him and figured by his son. Nothing new is of course to be added to MICHAEL SARS' concise and accurate description.

In its geographical distribution this species seems to be confined to the North Atlantic. It not infrequently occurs in the deepest hollows of the Norwegian fjords, as Christiania Fiord, Sogne Fiord, West Fiord, Porsanger Fiord and Tana Fiord. During the Norwegian North Atlantic Expedition it was also obtained at four other stations more or less far out at sea; two of which are situated off the West coast of Norway, and the others between Finmarken and Beeren Island. It also occurs, according to Goës, at »Skårberget», the deepest place (80—90 fathoms) in Gullmar Fiord, Bohuslän. But on the other side of the North Atlantic it has also been recorded, although it seems here to be still more rare than on the European. Thus HANSEN enumerates it in his catalogue of *Malacostraca* from West Greenland from lat. 65° 35' N., long. 54° 50' W. depth 80 fathoms, and another specimen from

»Greenland». By SMITH¹ it has been mentioned as occurring in the Gulf of Maine, off the coast of Nova Scotia, and at two more stations off the Atlantic coast of United States, in depths ranging from 101 to 524 fathoms. The greatest depth at which it has been dredged, was 672 fathoms (= 1229 m.), in the inner part of Sogne Fiord.

Although, at present, occurring but very rarely within the Arctic Ocean, the species is, in all probability, of an Arctic origin. Like *Munnopsis typica*, *Calathura brachiata* and others, it dwells now, since the great fiords of Norway have been partly obstructed from free communication with the open sea by submarine ridges, only in the very deepest hollows of the fiords, where the conditions are most analogous with those of the Arctic Ocean.

Length of greatest spec. (a female with roe from stat. 41.) 64 mm.

The eggs are, contrary to what might have been anticipated in such a deep-sea form, small and numerous, although relatively larger than in *Crangon Allmanni*. The cleavage was just finished, but no formation of embryo was yet to be observed, all eggs being about the same stage.

10. *Pontophilus spinosus* (LEACH.)

1815. *Crangon spinosus* LEACH, A tabular View etc., l. c. p. 146.
 1853. » » BELL, Hist. Brit. Stalk-eyed Crust., p. 261.
 1862. *Cheraphilus* » KINAHAN, On the Brit. Spec. of Crangon and Galathea etc., l. c. p. 74, Pl. VII.
 1862. *Pontophilus spinosus* M. SARS, Bemærkn. over Crangoninerne etc., l. c. p. 185.
 1863. *Crangon spinosus* HELLER, Crust. Südl. Europa, P. 229, Taf. VII, Fig. 16,
 1868. *Pontophilus spinosus* M. SARS, Bidrag til kundskab etc., l. c. p. 264, Tab. II, Figg. 38—45, Tab. III, Figg. 46, 47.
 1890. » » G. O. SARS, Dekapodernas Forvandlinger, III, l. c. p. 153, pl. III.

Locality:

in 1899:

- stat. 1. lat. 61° 16' N., long. 1° 18' E., depth 150 m., sand, some stones and dead shells, 31/V, three spec.

¹ SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 61, and, idem, Decapoda, l. c. p. 34.

This form from which the former must be regarded as a distinct species,¹ since G. O. SARS has made his important discoveries with regard to the development of *Crangonidæ* was first obtained off the coasts of England and Ireland. Later on, M. SARS, BOECK, and DANIELSSEN dredged it at several places on the Southern and Western coasts of Norway as far north as Christiansund, in lat. 62° 35' N., but everywhere its occurrence was very rare. It lives mainly in moderate depths ranging from 30—60 fathoms. GOËS enumerates it amongst Decapoda from Bohuslän. It has also been found in the Mediterranean, in Adria. This fact, together with its occurrence in shallower water, point to its more Southern origin, as opposed to that of the preceding species.

Length of greatest spec. 31 mm. The largest specimens which M. SARS measured reached a length of 43 mm.

Nectocrangon BRANDT 1851.

Syn. **Argis KRÖYER 1842—43.**

11. Nectocrangon lar (OWEN).

1839. Crangon lar OWEN, Zoology of Captain BEECHEY's Voyage, p. 88, pl. XXVIII, Fig. 1.

1842—43 Argis lar KRÖYER, De hidtil bekj. nord. Krangon-Art., l. c. p. 255. Tab. V. Figg. 45—62.

Localities:

in 1899:

stat. 39. lat. 72° 45' N., long. 22° 58' W., depth 35—60 m., light yellowish-brown clay, one spec.

in 1900:

stat. 27. Kaiser Franz Joseph Fiord, Muskox Fiord, depth 220 m., clay, 21/VIII, one spec., mutilated det. LÖNNBERG.

This species, first described by OWEN, was made the type of a new genus by KRÖYER, but as that name *Argis* had unfortunately, been used before, it had to be dropped to make room for *Nectocrangon* BRANDT 1851. Another species, *Nectocrangon alaskensis*, was described by KINGSLEY, in 1882, from Alaska.

¹ GOËS considered both species as identical, l. c. p. 173.

Distribution: *Nectocrangon lar* has a rather restricted range within the Arctic Ocean. It has been obtained in the Behring Sea, off Alaska, »Arctic Ocean» (OWEN), Smith Sound, Baffin Bay, Davis Strait, Labrador, New Foundland, Nova Scotia, East Greenland. But from this coast, where it seems to be rare, only five specimens having been previously recorded (HANSEN), as far as the Behring Sea, no specimen has hitherto occurred within the whole of this large area.

It is found mostly on muddy bottom, so that KRÖYER first called it by the specific name *argilicola* which, however, must yield priority to the less appropriate *lar*. It ranges vertically from a few to 120 fathoms.

Length 95 mm. (st. 39. 1899).

Sabinea KRÖYER 1842—43.

12. Sabinea septemcarinata (SABINE).

1827. Crangon septemcarinatus SABINE, Supplement to the Appendix to Capt. Parry's Voyage 1819—1820, p. CCXXXVI, Pl. II, Figs. 11—13.
- 1842—43. Sabinea (Crangon) septemcarinata KRÖYER, De hidtil bekj. nord. Krangon-Art., l. c. p. 244. Tab. IV, Figs. 34—40, Tab. V, Figs. 41—44.
1846. (?) Myto Gaimardii idem, Voy. en Scand. etc., l. c. pl. 7, fig. 1 a—q. (young stage).
1879. Sabina septemcarinata SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 57. Pl. XI, Figs. 5, 9—13.
1882. » » HOEK, Crust. »Willem Barents», l. c. p. 12.
1887. » » HANSEN, Dijnphna-tógtets zool. bot. Ud- bytte, p. 237.
1890. » » G. O. SARS, Decapodernas Forvandlinger, III, l. c. p. 168, pl. V, pl. VI, fig. E1—13.
1897. » » BIRULA, Essai d'une faune des crustacés décapodes etc., l. c. p. 431, tab. XX, figs. 6, 6 a, 6 b.
1900. » » STEBBING, Arctic Crustacea, l. c. p. 6.

Localities:

in 1898:

- stat. 7. lat. 77° 25' N., long. 27° 30' E., N. of Hope Island, depth 160 m., bottom temp. — 1,71° C., brownish-yellow clay, 23/VI, two spec.

- stat. 8. lat. 76° 50' N., long. 17° 20' E., Stor Fiord, depth 14—18 m., stony bottom with Laminariæ, 25/VI, one spec.
- » 12. Recherche Bay, near to Fox Glacier, West Spitzbergen, depth 90 m., stony bottom 4/VII, three spec.
- » 13. Recherche Bay, off Fox Glacier, depth 75 m., stony bottom with dead shells and soft bluish-gray clay 5/VII, three spec.
- » 17. Recherche Bay, the anchorage, depth 0—20 m., stony bottom, 13/VII, five spec.
- » 30. King Charles Island, Swedish Foreland, depth 10—16 m., grayish-black sand, stones, mud and algæ, 6/VIII, one spec.
- » 32. King Charles Island, Rivalen Sound, depth 100—110 m., bottom temp. — 1.45° C., soft clay with boulders, 8/VIII, eight spec.
- » 34. lat. 78° 50' N., long. 29° 39' E., King Charles Island, depth 60—70 m., soft, grayish-black clay, 17/VIII, one spec.
- » 35. lat. 80° 15' N., long. 33° 10' E., White Island (New Island), depth 40—50 m., rocky bottom, 18/VIII, seven spec.
- » 37. lat. 81° 14' N., long. 22° 50' E., depth 150 m., grey mud, eight spec.
- » 38. lat. 79° 47' N., long. 14° 28' E., entrance of Liefde Bay, depth 140 m., stony bottom with red algæ, 25/VIII, two spec.

in 1899:

- stat. 29. lat. 70° 27' N., long. 22° 35' W., Scoresby Sound, Cape Stewart, depth 13—18 m., mud, boulders, algæ, 30/VII, one spec.
- » 39. lat. 72° 45' N., long. 22° 56' W., depth 35—60 m., mud and stones, 18/VIII, two spec.
- » 40. lat. 72° 1' N., long. 23° 3' W., depth 32—40 m., mud, 20/VIII, two spec.
- » 43. lat. 73° 32' N., long. 24° 38' W., Kaiser Franz Joseph Fiord, Cape Weber, depth 100—110 m., mud with pebbles and stones, 28/VIII, one spec.

in 1900:

- stat. 3. Ice Fiord, Coal Bay, West Spitzbergen, depth 50—100 m., stones, 22/VI, det. LÖNNBERG.
- » 16. lat. 72° 25' N., long. 17° 56' W., E. of Greenland, depth 300 m., pebbles and sand, 30/VII, det. LÖNNBERG.
- » 17. East Greenland, Mackenzie Bay N. of Kaiser Franz Joseph Fiord, depth 12—35 m., mud, 1/VIII—3/VIII, det. LÖNNBERG.
- » 19. lat. 74° 35' N., long. 18° 15' W., S.E. of Pëndulum Island, depth 150 m., mud and stones, 5/VIII, det. LÖNNBERG.

stat. 22. East Greenland, Mackenzie Bay N. of Kaiser Franz Joseph Fiord, depth 12—18 m., mud, 9/VIII, det. LÖNNBERG.

Sabinea was founded in 1842 by KRÖYER to receive SABINE'S *Crangon septemcarinata*. Later on SMITH drew the attention to the fact that two forms had been confounded under that name, the chief differences being the form of the rostrum and telson and the more pronounced armament of the longitudinal *cristæ* on the carapace. Still, there exist some doubts, if *Sabinea Sarsii* may be entitled to specific value. SPENCE BATE, in his Challenger Report on the Macrura,¹ describes and figures as *Sabinea septemcarinata* specimens taken off Nova Scotia which undoubtedly belong to *Sabinea Sarsii*. Later on, ORTMANN and DOFLEIN consider them as identical, without giving any reasons for this view. DOFLEIN despatches the whole matter with the following passage:² »Ich halte *septemcarinatu* und *sarsi* für identisch oder höchstens für Varietäten derselben Art. Mein Material zeigt bedeutende Schwankungen in den von SMITH angegebenen Merkmalen.» It is only to be regretted that the author of that work did not deal with any details in favour of this argument, whereby he might at least have thrown some fresh light on our knowledge of Arctic Decapoda.

When examining my material of *Sabinea* I found that all specimens agree exactly with the description given by KRÖYER and SMITH. The form of the rostrum, and that of the telson and its armament with spines, closely resemble that of *Sabinea septemcarinata*. The only deviating point applies to the number of spines of the median dorsal *crista*. In a number of individuals of smaller size, up to 40 mm. length, there are nearly regularly six spines, instead of five as SMITH has observed in his specimens, and, besides that, the spines of the *cristæ* are also more prominent than in the older ones; but that, however, may be accounted for by the age, as we may notice the same fact in *Sclerocrangon*. Only in one old female of 72 mm. length I found six small spines in the median dorsal *crista*, but, in all other fullgrown specimens, there was the regular number of five small ones, and in no single specimen out of all that I have examined, have I found

¹ l. c. p. 498, pl. LXXXIX, fig. 2, pl. XC, fig. 1.

² l. c. p. 328.

the form of telson and rostrum as in *Sabinea Sarsii* as figured by SMITH, SPENCE BATE, and BIRULA. Thus, I consider like SMITH, SARS, HANSEN, STEBBING, BIRULA and others *Sabinea septemcarinata* and *Sabinea Sarsi* as »good species».

Even if one had some hesitation with regard to this, every doubt must disappear after the important discoveries that SARS has published about the metamorphosis of the *Crangonidæ*. In the paper cited above he figures¹ the telson of very small individuals of both species, and even in these young stages, the difference between both is still more striking than in older ones.

Distribution: This is one of the most common decapods in the Arctic Ocean. It has been obtained off nearly every coast. Thus, I enumerate the following places: Western and Northern coasts of Norway, Spitsbergen, Barents Sea, White Sea, Nova Semla, Siberian Polar Sea, Smith Sound, Baffin Bay, Davis Strait, Nova Scotia, New England, East Greenland, Iceland. Thus it is to be considered as Arctic and circumpolar. *Sabinea Sarsii* is occurring off North Eastern coast of U. States, off Nova Scotia, off South Western coast of Greenland, where *Sabinea septemcarinata* is also rather scarce (HANSEN), off Western coast of Norway up to the Lofoten Islands.

The vertical range of *Sabinea septemcarinata* extends from a few up to 300 meters; that of *Sabinea Sarsii* seems to be more or less the same.

DOFLEIN² suggests that *Sabinea septemcarinata* is an inhabitant of muddy bottom. In this I cannot agree with him; both my own experience and the statements of others fail to confirm that. In the list of localities one will find rocks, gravel, sand, and algæ as common as mud.

Length of greatest spec., a female, from stat. 39 in 1899
81 mm.

Nearly all full-grown females were carrying eggs.

¹ l. c. p. 180, tab. XV, figs. 24, 25.

² l. c. p. 328.

Fam. Alpheidæ.

Bythocaris G. O. Sars.

13. *Bythocaris simplicirostris* G. O. Sars.

Fig. 1.

1870. *Bythocaris simplicirostris* G. O. Sars, Nye Dybvandscrust. fra Lofoten, l. c. p. 149.
 1886. » » G. O. Sars, Norw. North Atl. Exp., II, p. 7.
 1897. » » BIRULA, Essai d'une faune des crustacés décapodes etc., l. c. p. 427, tab. XX, fig. 3.

Locality:

in 1900:

- stat. 21. East Greenland, off Kaiser Franz Joseph Fiord, between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, one spec.

Of this species, upon which G. O. Sars based his genus *Bythocaris*, mainly distinguished from *Hippolyte* by the structure of the mandibles, I found a single female amongst a number of *Bythocaris Payeri*. In all essential details it closely agrees with Sars' description. Thus the dorsal *carina* is provided with two small spines, the hindmost of which is, however, very minute and almost blunt. The third segment of pleon has a median dorsal hook. Telson, as in *Bythocaris leucopis*, with four minute spinules on either side. The basal joint of the peduncle of antennæ has a spine on the inner margin. The scales of the antenna rather remind us of that in *Bythocaris Payeri* than of that in *Bythocaris leucopis*. Mandibles, maxilla, and maxillipeds, as in last species. Last joint of third pair of maxillipeds with 8—9 spinules. Fifth joint of second pair of pereopods divided into 10 articulations.

The specimen was an egg-carrying female; the eggs, as is usual in the genus, being of large size and few in number.

This species, which is easily recognizable from its nearest allied species, by the form of the rostrum was observed for

the first time by G. O. Sars at a place off the Norwegian coast at a depth of 250 fathoms. Later on, two mutilated specimens were taken during the Norwegian North Atlantic Expedition between Beeren Eiland and Finmark, and W. of Spitzbergen, in depths of resp. 191 and 416 fathoms. BIRULA mentions it in his memoir on *Decapoda* from the White Sea and the Murman Coast. It seems everywhere to be very scarce.

Length 42 mm.

14. *Bythocaris leucopis* G. O. Sars.

1879. *Bythocaris leucopis* G. O. Sars, *Crust. et Pycnog. nova etc.*, l. c. p. 427.

1885. » » G. O. Sars, *Norske Nordhavsexp.*, I. p. 27, pl. III, figs. 1—26.

Localities:

in 1898:

- stat. 27. lat. 77° 52' N., long. 3° 5' W., 40' of S.W. of »the Swedish Depth», depth 2750 m., bottom temp. — 1,4° C. Biloculina clay, 29/VII, several spec.
- » 28. lat. 76° 36' N., long. 12° 10' E., 50' W. of Horn Sound, depth 1750 m., bottom temp. — 1,3° C., transition clay, 1/VIII, seven spec.

in 1900:

- stat. 29. lat. 72° 42' N., long. 14° 49' W., between Greenland and JAN MAYEN, depth 2000 m., clay with foraminifers, 27/VIII, six spec. det. LÖNNBERG.

This magnificent Caridian was first obtained in four specimens during the third cruise of the Norwegian North Atlantic Expedition at stat. 295 between JAN MAYEN and Finmarken from a depth of 1110 fathoms. Remains of two other specimens were, after the return of the expedition, found in the stomach of *Rhodichthys regina* COLLETT from stat. 297 lying a little farther west and from no less than 1280 fathoms. My specimens are from the same cold area, although the stations are situated somewhat farther north. From no other places has this species hitherto been obtained, so far as I know.

Some of my specimens were females carrying roe in different stages of development beneath the abdomen. In

some of the eggs nearly whole the yolk was consumed, and the hind part of the body of the embryo had protruded from the embryonic membrane. In others the embryo was in a much less developed stage. The eggs are, comparatively speaking, very large and few in number as must be expected, considering the fact that the embryo does not leave the pleopods of the mother, before it has reached its complete state of development. As among so many animals inhabiting either the Arctic or Antarctic Oceans or the deep-sea, that rule seems to prevail also in the class of crustaceans. It was G. O. SARS, who, when examining *Bythocaris simplicirostris*, the type of the genus, first called attention to the great size of the eggs as possibly indicating a peculiar and abbreviate development. Other Arctic *Decapoda* exhibit the same condition. DOFLEIN¹ points out among such decapods *Hippolyte polaris*, *H. spinus*, *H. Gaimardii*, and *Sclerocrangon boreas*.

The colour of *Bythocaris leucopis* is a bright red with a lighter tint on the antennæ and the sides of the abdomen. The eyes are opaque white, as the specific name implies.

Length of my largest specimen from stat. 29, 1900, 77 mm., or, with the antennal scalet, 95 mm., exactly the same length as SARS' greatest specimen attained.

15. *Bythocaris Payeri* (HELLER).

1878. (1875). *Hippolyte Payeri* HELLER, Crust., Pycnogon. and Tunicat. etc., l. c. p. 26, taf. I, fig. 1—4.
 1877. *Bythocaris Payeri* G. O. SARS, Prodr. descript. Crust. etc., l. c. p. 240.
 1882. » *payeri* HOEK, Crust. »Willem-Barents» etc., l. c. p. 19, taf I, fig. 8—9.
 1885. » *Payeri* G. O. SARS, Norw. North Atlant. Exp., l. p. 33, pl. III, fig. 27.
 1897. » *payeri* BIRULA, Essai d'une faune des crustacés décapodes etc., l. c. p. 428.

Localities:

in 1898:

stat. 40. lat. 79° 58' N., long. 9° 30' E., 19—20 miles N.W. of Danish Island, depth 435 m., bottom temp. + 1,5° C., gray clay,

¹ l. c. p. 355.

stones, 27/VIII, one mutilated spec. with the eyes abnormally developed, the left being much larger than the right, which is nearly rudimentary.

in 1899:

- stat. 2. lat. 62° 15' N., long. 0° 37' W., depth 670 m., mud with gravel, 1/VI, four spec.
- » 17. lat. 71° 12' N., long. 8° 38' W., off JAN MAYEN, depth 1275 m., gray clay, 24/VI, one spec.
- » 18. lat. 74° 52' N., long. 17° 16' W., depth 350 m., muddy clay with sand and pebbles, 4/VII, nine spec.
- » 25. lat. 72° 28' N., long. 21° 48' W., depth 180 m., mud with some stones, 24/VII, one spec.

in 1900:

- stat. 16. lat. 72° 25' N., long. 17° 56' W., E. of Greenland, depth 300 m., stones and sand. 30/VII, det. LÖNNBERG.
- » 21. East Greenland off Kaiser Franz Joseph Fiord between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, several spec., det. LÖNNBERG.
- » 25. East Greenland, off the entrance of Kaiser Franz Joseph Fiord, depth 200—300 m., mud, 14/VIII, det. LÖNNBERG.
- » 27. East Greenland, Kaiser Franz Joseph Fiord, Muskox Fiord, depth 220 m., clay, 21/VIII, det. LÖNNBERG.

This species was first described by HELLER as *Hippolyte Payeri* on specimens obtained during the famous Austro-Hungarian Polar Expedition off Franz Joseph Land. Later on it occurred at no less than three stations during the Norwegian North Atlantic Expedition and it was referred by SARS to *Bythocaris* instituted by him some years before. Subsequently it has been found by »Willem Barents» Expedition at one station in Barents Sea and by BIRULA off Murman Coast. As seen above, it was obtained, during the last Swedish Arctic Expeditions, at nine stations in a rather considerable number of individuals.

My specimens do not show any differences from the descriptions of HELLER and SARS. Like the last author, I have, however, in one fullgrown ovigerous female, observed one distinct although small spine on the anterior part of the dorsal carina, and also in some younger ones from the same station, viz. stat. 18. 1899, a very faint, nearly imperceptible trace of the same. Some females were carrying eggs, although the embryos were in a much less developed stage than those of the preceding species.

It ranges vertically from 200 until 2000 m. *Length* of greatest spec. 50 mm. The specimen from stat. 40, 1898, seems to be somewhat larger, but as it was not complete, its real size could not be ascertained.

Hippolyte LEACH 1813.

This genus includes numerous species many of which have been for a long time known. However, strange to say, but few families amongst the *Macrura* are involved in such confusion and are so much in need of a critical revision as this. In 1888, SPENCE BATE, when examining the material collected by the »Challenger», subdivided his family *Hippolytidae* into several genera. He based his division mainly on the structure of the mandible, if provided with »synnhipod» (= palp) and »psalidoma» (= cutting edge) or not, on the number of the joints constituting the fifth joint or carpus (= »wrist») of the second pair of pereopods and on the number and structure of branchiæ. Mainly by using these characteristics he was able to arrange the »Challenger» *Hippolytidae* s. str. under no less than nine different genera.

It is only to be regretted that he did not at the same time examine and classify other forms belonging to this family. As far as I know, no other attempt has been made since that time as to a monographic study of the group. Amongst writers after SPENCE BATE some have adopted his genera, others not.

In his very useful and important book: »A History of Crustacea», STEBBING gives some interesting and critical reflections both on SPENCE BATE's new and somewhat complicated nomenclature, as well as on special points in his classification. In regard to *Hippolytidae*, he adopts,¹ among others, SPENCE BATE's *Spirontocaris*, to which he refers the following North Atlantic and Arctic species: *Hippolyte spinus*, *H. turrida*, *H. Cranchii*, *H. pusiola*, *H. polaris*.

As to the genus *Hetairus*, the type of which SPENCE BATE regards our common Arctic *Hippolyte Gaimardi*, STEBBING

¹ l. c. p. 236, Arctic Crust. l. c. p. 10.

points out¹ that SPENCE BATE's description is contradictory in one essential character, and even incorrect in another. For this reason he does not find it appropriate to maintain that genus.

In a paper of ORTMANN, published in Princeton Univ. Bulletin last year and cited by DOFLEIN, I find that this author also adopts *Spirontocaris* and that he includes in this genus: *Hippolyte Gaimardii*, *H. Phippsi* (= *H. turgida*), *H. spinus*, *H. polaris* (= *H. borealis*, which ORTMANN considers as specifically distinct) and *H. groenlandica*.

In this list, where only a few species have to be enumerated, I refrain from a critical study, for want of time and material, and I retain, therefore, the old name in the hope that a monograph of the family may soon appear. It has been promised by DOFLEIN.

16. *Hippolyte Gaimardii* H. MILNE EDWARDS.

1837. *Hippolyte Gaimardii* MILNE EDWARDS, Hist. Nat. Crust., tome II, p. 378.
 1840—41. » » KRÖYER, Uds. nord. Art. Slægt. Hippolyte, l. c. p. 572.
 1840—41. » gibba *Gaimardii* KRÖYER, ibidem, p. 572.
 1842. » *Gaimardii* KRÖYER, Monogr. Fremst Slægt. Hippolytes nord. Art., l. c. p. 282, tab. I, fig. 21—29.
 1842. » gibba KRÖYER, ibidem, p. 288, tab. I, fig. 30, tab. II, fig. 31—37.
 1864. » *Gaimardi* GOËS, Crust. decapoda podopleth. mar. Sueciæ etc., l. c. p. 168.
 1879. » *Gaimardii* SMITH, Stalk-eyed Crust. Atl. Coast North America etc., l. c. p. 67, pl. IX, fig. 8, 9.
 1882. » *gaimardii* HOEK, Crust. »Willem Barents» etc., l. c. p. 13.
 1886. » *Gaimardii* KOELBEL, Crust., Pycnog. und Arachn. von JAN MAYEN, l. c. p. 50.
 1887. » » HANSEN, Dijnphna-togtets zool. bot. Udbytte, p. 238.
 1888. *Hetairus Gaimardii* SPENCE BATE, Crust. Macrura, Chall. Rep., l. c. p. 611, pl. CIX, fig. 2.
 1897. *Hippolyte gaimardi* BIRULA, Essai d'une des crustacés décapodes etc., l. c. p. 425, tab. XX, fig. 2.

¹ l. c. p. 235.

1899. *Spirontocaris Gaimardii* SCOTT, Crust. Franz Joseph Land, l. c.
p. 63, pl. 3, fig. 3, 4.
1900. » » STEBBING, Arctic Crustacea, l. c. p. 9.

Localities:

in 1898:

- stat. 5. lat. 75° 49' N., long. 24° 25' E., between Beeren Island and Hope Island, depth 80 m., bottom temp. — 1,42, rocky bottom, 21/VI, many spec.
» 6. lat. 76° 45' N., long. 26° E., Hope Island, depth 40 m., rocky bottom, 22/VI, two spec.
» 8. lat. 76° 50' N., long. 17° 20' E., Stor Fiord, depth 14—18 m., stony bottom with *Laminariæ*, 25/VI, two spec.
» 12. West Spitzbergen, Recherche Bay near to Fox Glacier, depth 90 m., stony bottom, 4/VII, eight spec.
» 13. Recherche Bay, off Fox Glacier. depth 75 m., stony bottom with dead shells and soft bluish-gray clay, 5/VII, two spec.
» 22. lat. 78° 22' N., long. 14° 53' E., Ice Fiord, off Cape Boheiman, depth 40—50 m., 21/VII, three spec.
» 39. lat. 79° 43' N., long. 10° 52' E., Danish Island, Virgos harbour, depth 25—30 m., gray mud, *Laminariæ*, 27/VIII, several spec.

in 1899:

- stat. 22. lat. 73° 30' N., long. 20° 18' W., Cape Broer Ruys, depth 25—27 m., gravels, some red algas, 18/VII, one spec.
» 29. lat. 70° 27' N., long. 22° 35' W., Scoresby Sound, Cape Stewart, depth 13—18 m., mud, stones, algæ, 30/VII, two spec.
» 39. lat. 72° 45' N., long. 22° 56' W., depth 35—60 m., mud, some stones, 18/VIII, two spec.
Tromsø, depth 60—70 m., 22/VI, several spec. WULFF.
West Spitzbergen, Green Harbour, depth 110 m., 30/VI, several spec. WULFF.
North Spitzbergen, Danish Gate, depth 20—30 m., 7/VII, numerous spec. WULFF.

in 1900:

- stat. 2. West Spitzbergen, Ice Fiord, Coal Bay, depth 100 m., rocks, 16/VI—20/VI, det. LÖNNBERG.
» 3. ibidem, depth 50—100 m., stones, 22/VI, det. LÖNNBERG.
» 17. East Greenland, Mackenzie Bay, N. of Kaiser Franz Joseph Fiord, depth 12—35 m., mud, 1/VIII—3/VIII, det. LÖNNBERG.
» 19. East Greenland, S.E. of Pendulum Island, lat. 74° 35' N., long. 18° 15' W., depth 150 m., mud and stones, 5/VIII, det. LÖNNBERG.
» 21. East Greenland, off Kaiser Franz Joseph Fiord between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, det. LÖNNBERG.

This species first mentioned by MILNE EDWARDS, was afterwards described by KRÖYER in his classical monograph of the Northern species of *Hippolyte*. At the same place he also describes another closely-allied form which he named *Hippolyte gibba*, the chief characteristic of which was: *Annulus abdominalis tertius carina superficiei dorsalis triangulari valde compressa armatus est.*

GOËS was the first who suspected that this is a characteristic peculiar to the males, and SMITH came to the same conclusion that KRÖYER's *gibba* was based on old males of *H. Gaimardii*. HOEK is the only one who thinks that the peculiar form of the third segment of pleon is only an individual variation, but all subsequent writers accord in believing *H. Gaimardii* and *H. gibba* to be females and males resp. of the same species.

SPENCE BATE established for this species the genus *Hetairus* which, however, as already mentioned, STEBBING has shown, is based on incorrect characteristics, and which he, therefore, refers to *Spirontocaris*.

As synonymous with *Hippolyte Gaimardii* SMITH has put forwards *H. pandaliformis* BELL, and *H. Belcheri* BELL, and in this he has been followed by most writers.

The species has a very wide distribution. It occurs along West Greenland as far north as lat. 78° 17' N., off Grinnell Land, off Baffin Land, Labrador, Nova Scotia and East coast of United States as far south as Boston, »Arctic Ocean and Bering Straits» (STIMPSON), North-East coast of Asia. There it has been recorded from Franz Joseph Land, Nova Semla, Spitzbergen, Barents Sea, Murman Coast, Norway, Kattegat, Western part of Baltic, at Kiel, Scotland, Iceland, and, now, for the first time, from East Greenland.

Its vertical range is from a few fathoms up to 200 fathoms or more.

Length of greatest specimen (from East Greenland) 70 mm.

Its sexual maturity is very variable. I have measured females with roe the length of which varied from 40 mm. to 60 mm. The former ones were from stat. 39. 1898, where the bottom temperature was above zero, while the larger ones were dredged at stat. 5. 1898, where the temperature on the bottom was 1.42° C. below zero. The individuals of that specimens collected by WULFF at Tromsø were all still smaller.

17. *Hippolyte spinus* (SOWERBY).

1805. *Cancer spinus* SOWERBY, British Miscellany, p. 47, tab. XXIII.
 1817. *Hippolyte Sowerbæi* LEACH, Malac. Podophth. Brit., tab. XXXIX.
 1842. » *Sowerbei* KRÖYER, Hippolytis nord. Arter, l. c. p. 298,
 tab. II, fig. 45—54.
 1879. *Hippolyte spinus* SMITH, Stalk-eyed Crust. of Atlant. Coast of
 North America, l. c. p. 68.
 1882. » » HOEK, Crust. » Willem Barents», l. c. p. 15,
 taf. I, fig. 4—7.
 1886. » » KOELBEL, Crust., Pycnog. und Arachn. von
 JAN MAYEN, l. c. p. 49.
 1887. » » HANSEN, Malacostraca mar. Groenl. occid.,
 l. c. p. 41.
 1888. *Spirontocaris spinus* SPENCE BATE, Crust. Macrura, Chall.
 Rep., l. c. p. 596, pls. CVICVI.
 1900. *Hippolyte spinus* DOFLEIN, Dekap. Krebse arkt. Meere, l. c.
 p. 332.

Localities:

in 1898:

- stat. 5. lat. 75° 49' N., long. 24° 25' E., between Beeren Island
 and Hope Island, depth 80 m., bottom temp. — 1,42° C.,
 rocky bottom, 21/VI, five spec.
 » 12. West Spitzbergen, Recherche Bay near to Fox Glacier,
 depth 90 m., stony bottom, 4/VII, two spec.
 » 35. lat. 80° 15' N., long. 33° 10' E., Giles Land (White Is-
 land), depth 40—50 m., rocky bottom, 18/VIII, one spec.
 » 38. lat. 79° 47' N., long. 14° 28' E., entrance to Liefde Bay,
 depth 140 m., stony bottom with red algæ, 25/VIII, one
 spec.

in 1899:

- stat. 39. lat. 72° 45' N., long. 22° 56' W., depth 35—60 m., mud,
 some stones, 18/VIII, four spec.
 Tromsø, depth 60—70 m., 22/VI, two spec., WULFF.
 West Spitzbergen, Green Harbour, depth 110 m., 30/VI,
 five spec. WULFF.

in 1900:

- stat. 1. West Spitzbergen, Ice Fiord, Coal Bay, depth 50 m., stony
 bottom with dead shells, 16/VI—20/VI, det. LÖNNBERG.
 » 2. Ibidem, depth 100 m., rocks, 16/VI—20/VI, det. LÖNNBERG.
 » 3. » depth 50—100 m., stones, 22/VI, det. LÖNNBERG.
 » 9. lat. 79° 10' N., long. 11° E., West Spitzbergen, W. of
 Cape Mitra, depth 100 m., mud, 2/VIII, det. LÖNNBERG.
 » 18. lat. 74° 30' N., long. 18° 40' W., East Greenland, S.E. of
 Walrus Island, depth 80—100 m., mud and stones, 4/VIII,
 det. LÖNNBERG.

This well-known species is subject to great variations with regard to the form of the rostrum and the number and size of its spines. Bearing this fact in mind, recent authors usually regard *Hippolyte securifrons* NORMAN, which has proved to be identical with *Hippolyte Lilljeborgii* DANIELSSEN, as synonymous with *Hippolyte spinus*.

Thus, SPENCE BATE has described and figured in his Challenger Report no less than seven varieties, and one must feel nearly convinced of the identity of both forms. As such these forms are also regarded, among others, by MIERS, HANSEN and STEBBING, whereas SMITH, SARS and ORTMANN are of a contrary opinion.

I have myself examined a good many specimens; but as I could not get NORMAN's original description, I do not think it advisable to pronounce with any degree of certainty about it. If that were not the case, then *Hippolyte Lilljeborgii* must claim priority, as DANIELSSEN published his »Beretning om en zoologisk Reise foretagen i Sommeren 1857» i Nytt Magazin for Naturvidenskaberne, Band 11, which appeared in the year 1861, and NORMAN's paper was published two years later.

DOFLEIN goes so far that he considers *Hippolyte Phippsi* (= *H. turgida*) as identical with young specimens of *H. spinus*, »besonders solchen, bei welchem das Rostrum noch nicht abgestossen war», l. c. p. 332. But, as usual, he does not enter upon detailed reasons for this view. He contents himself with the following remark: »Betrachte ich aber das gesammte Material, so kann ich so viel Uebergänge zu *H. Phippsi* feststellen, insbesondere zu den als *turgida* and *macilenta* von KRÖYER als besondere Arten beschriebenen Formen von *Phippsi*, dass ich glaube, es handelt sich nur um eine Art, welche dem Prioritätsgesetze gemäss den Namen *H. spinus* Sow. tragen muss. Diese Annahme wird auch durch die ganz gleichartige Verbreitungsweise der fraglichen Species unterstützt (!).¹ Die Auffassung von SP. BATE (Chall. Rep.) leitet zu der hier vorgetragenen über.» Strangely enough, he enumerates, however, both *Hippolyte Phippsi* and *H. spinus* and even *H. Lilljeborgi* (= *H. securifrons*) as distinct species. It is to be regretted that the author did not give any de-

¹ As he himself points out, this is circumpolar for both forms.

tailed descriptions, accompanied with figures, of the transitional forms between both species, as such would have proved of very great interest.

As to my own opinion, I can not, at any rate at present think that DÖFLEIN is right in this view. I have examined and compared a not inconsiderable number of both species, but I was not able to observe any intermediate forms. On the contrary, both forms seemed, in my collection, to be so very distinct, that I was able at the very first glance, to separate them. In nearly all specimens of *Hippolyte spinus* the rostrum had the typical form as figured by KRÖYER in tab. II, fig. 45, l. c. whereas hardly any one specimen of *H. turgida* deviated in the form of rostrum from fig. 57 on the same plate, or from fig. 64 on pl. III. As most of them were females carrying roe, the prevailing form of rostrum was that figured in fig. 57 by KRÖYER as typical for his *Hippolyte turgida*. Besides that, it is very easy to distinguish both species (at least, the females) on the more robust form of the body and its smaller size in *Hippolyte turgida* than in *H. spinus*. The spines on the dorsal carina are also, in this species, much stronger and larger than in *H. turgida*. However, it is possible they may be united under one species, and it is for this reason that further details on transitional forms would be very welcome.

Hippolyte spinus has a very extensive distribution within the Arctic region. It is obtained off the coasts of the following countries: West Greenland as far north as Cape York and Ingelfield Gulf, Grinnel Land, Baffin Land, Labrador, Nova Scotia, New England as far south as Massachusetts Bay, where »it is by far the most abundant species of the genus» (SMITH, l. c. p. 69), Alaska, Behring Strait, Kamtschatka, Nova Zembla, Kola Peninsula, Finmarken, Beeren Island, Spitzbergen, East Greenland. But here it seems to be rather rare, as it occurred only at two stations during the last Swedish Expeditions. Although it is very probable that it has a circumpolar range, it is, however, worth remarking that it has not as yet been found in the shallow sea along the Siberian coast from Nova Zembla in the west to Bering Sea in the east.

If *Hippolyte Lilljeborgi* is identical it goes farther south along the West Coast of Norway and Scotland. It lives

mainly in depths from a few to 50 fathoms, but it has also but seldom, been dredged in deeper water until 200—240 fathoms.

Length of largest spec. 62 mm.

It was, although very seldom, infested by apparently the same *Piscicolid* which is so common a parasite on *Sclerocrangon boreas*.

18. *Hippolyte turgida* KRÖYER.

- 1840—41. *Hippolyte turgida* KRÖYER, Uds. nord. Art. Slægt. Hippolyte, l. c. p. 575.
 1840—41. » *Phippsii* KRÖYER, ibidem, p. 575.
 1842. » *turgida* KRÖYER, Monogr. Fremst. Slægt. Hippolytes nord. Arter, l. c. p. 308, tab. II, fig. 57—58, tab. III, fig. 59—63.
 1842. » *Phippsii* KRÖYER, ibidem, p. 314, tab. III, fig. 64—68.
 1864. » » GOËS, Crust. decapoda podophth. mar. Sueciæ etc., l. c. p. 169.
 1874. » *turgida* BUCHHOLZ, Crust. Zweite deutsche Nordpolarfahrt, l. c. p. 273.
 1874. » *Phippsii* BUCHHOLZ, ibidem, p. 274.
 1879. » » SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 73.
 1882. » *Phippsii* HOEK, Crust. »Willem Barents», l. c. p. 17.
 1897. » » BIRULA, Essai d'une faune des crustacés décapodes etc., l. c. p. 422.
 1899. (?) *Spirontocaris Phippsii* SCOTT, Crust. Franz Josef Land, l. c. p. 63, pl. 3, fig. 3, 4.
 1900. » *turgida* STEBBING, Arctic Crustacea, l. c. p. 10.

Localities:

in 1898:

- stat. 10. lat. 77° 9' N., long. 14° 40' E., off the Islands, depth 90 m., soft, gray clay, 27/VI, one spec.
 » 13. West Spitzbergen, Recherche Bay off Fox Glacier, depth 75 m., stony bottom with dead shells and soft bluish-gray clay. 5/VII, two spec.
 » 22. lat. 78° 22' N., long. 14° 53' E., Ice Fiord, off Cape Bohe-man, depth 40—50 m., 21/VII, one spec.
 » 39. lat. 73° 43' N., long. 10° 52' E., Danish Island, »Virgo's harbour», depth 15—30 m., gray mud, Laminariæ, 27/VIII. three spec.

in 1899:

- stat. 29. lat. 70° 27' N., long. 22° 35' W., Scoresby Sound, Cape Stewart, depth 13—18 m., mud, boulders, algæ, 30/VII, one spec.
 Tromsø, depth 60—70 m., 22/VI, many spec. WULFF.
 West Spitzbergen, Green Harbour, depth 110 m., 30/VI, one spec. WULFF.
 North Spitzbergen, Danish Gat, depth 20—30 m., 7/VII, many spec. WULFF.

in 1900:

- stat. 1. West Spitzbergen, Ice Fiord, Coal Bay, depth 50 m., stony bottom with dead shells, 16/VI—20/VI, det. LÖNNBERG.
 » 3. ibidem, depth 50—100 m., stones, 22/VI, scarce, det. LÖNNBERG.

The first one who suspected that *Hippolyte turgida* and *H. Phippsii* were only female and male resp. of the same species was GOËS who, in the paper cited above, says: »Centurias perlustravi Spetsbergenses, nec feminam umquam inveni; Hippol. turgidæ KRÖYER, valde affinis et sodalis, inter specimina 100 circiter masculum nullum vidi, quare, et differentiis tam exiguis, inclinatus animus, ut illam hujus marem arbitrer.»

As far as I know, BUCHHOLZ is the only author subsequent to GOËS who does not confirm this opinion. He bases the contrary supposition on the fact that he found amongst about 30 specimens of *Hippolyte Phippsii* one female of a length of 33 mm., and because males, although relatively very scarce, are nevertheless, to be observed in *H. turgida*. For this reason he does not consider them as different sexes of the same species, but only as varieties. As SMITH has shown, young ones of both forms are indistinguishable, except in the sexual characteristics, and, in this sense, GOËS' statement is not strictly true, but, with regard to fullgrown specimens, SMITH says that he never saw males agreeing with *H. turgida* as described by KRÖYER. As to the above mentioned male of *H. turgida*, SMITH does not hazard the supposition that there was some error in BUCHHOLZ' determination; yet it can hardly be explained otherwise, as no subsequent author, as far as I know, mentions a similar case, but all agree in regarding both forms as identical.

As synonymous with *Hippolyte turgida* SMITH considers *Hippolyte vibrans* STIMPSON, and, with a sign of interrogation, *Hippolyte ochotensis* BRANDT.

In regard to the priority of *turgida* or *Phippisii* STEBBING remarks, in his usual humorous style, that it »has been as a rule set aside, probably under the idea that the male was so obviously the superior animal that no rules of nomenclature could compete with its claim to preferential notes.

This species is widely distributed within the Arctic sea. It has been obtained at East Greenland, West Greenland as far north as Port Foulke, lat. 78° 17' N., Grinnell Land in lat. 81° 44' N., Baffin Land, Labrador, Nova Scotia, East coast of United States as far south as Massachusetts Bay, Arctic North America and Behring Sea, Sea of Okhotsk (?), Arctic coast of Siberia, Kara Sea, Nova Zembla, Franz Joseph Land (?), White Sea, Spitzbergen, Northern coasts of Norway, although rare south of the Arctic Circle.

HANSEN, on reasons which he puts forwards in his *Mala-costraca marina Groenlandiæ occidentalis* regards this species as an inhabitant of the coast, living commonly in depths from three up to 25 fathoms, and occurring spontaneously perhaps in deeper water, but hardly in more than 60 fathoms.

Length of greatest spec. (from stat. 13, 1898) 41 mm.

The specimens from Tromsø, although fullgrown, were all much smaller, attaining about half that length.

19. *Hippolyte pusiola* KRÖYER.

- | | | |
|----------|---|--|
| 1840—41. | | Hippolyte pusiola KRÖYER. Uds. nord. Art. Slægt. Hippolyte, l. c. p. 576. |
| 1842. | » | KRÖYER, Monogr. Fremst. Slægt. Hippolytes nord. Art, l. c. p. 319, tab. III, fig. 69—73. |
| 1879. | » | SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 77, pl. IX, figs. 4—7. |
| 1897. | » | BIRULA, Essai d'une faune des crustacés décapodes etc.. l. c. p. 423. |

Locality:

in 1899:

Tromsø, depth 60—70 m., 22/VI, four spec., WULFF.

Distribution: Murman Coast, Coast of Norway, Skagerrack, Kattegat, coast of Scotland, Iceland, East coast of North America from Connecticut as far north as Nova Scotia and Prince Edward Island. Thus, this small *Hippolyte* does not seem to be an Arctic form, but it belongs rather to the Northern parts of the North Atlantic both on the European and the American side.

SMITH who has, with his usual carefulness, examined more than a hundred specimens, gives, in his »Stalk-eyed Crustaceans of the Atlantic Coast of North America north of Cape Cod», details as to the variation in rostrum, telson, and colour.

The largest specimen (a female carrying egg) measured 19 mm. According to SMITH, it reaches a length of 25 mm.

20. *Hippolyte polaris* (SABINE).

1821. *Alpheus polaris* SABINE, Parry's Voyage, Appendix n:o X, Zoology, k. 60, pl. II, fig. 5—8 (cited after STEBBING).
1835. *Hippolyte polaris* OWEN, Ross's 2nd Voyage, App. Zool., p. LXXXV.
1835. » *borealis* OWEN, ibidem, p. LXXXIV, pl. B, fig. 3.
- 1840—41. » *polaris* KRÖYER, Uds. nord. Art. Slægt. *Hippolyte*, l. c. p. 577.
- 1840—41. » *borealis* KRÖYER, ibidem, p. 577.
1842. » *polaris* KRÖYER, Monogr. Fremst. Slægt. *Hippolytes* nord. Art., l. c. p. 324, tab. III, fig. 78—81, tab. IV, fig. 82.
1842. » *borealis* KRÖYER, ibidem, p. 330, tab. III, fig. 74—77.
1864. » *polaris* GOËS, Crust. decap. podophth. mar. Sueciæ, l. c. p. 169.
1874. » » BUCHHOLZ, Crust. Zweite deutsche Nordpolarfahrt, l. c. p. 275.
1874. » *borealis* BUCHHOLZ, ibidem, l. c. p. 276.
1879. » *polaris* SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 80.
1882. » » HOEK, Crust. »Willem Barents», l. c. p. 18.
1886. » » KOELBEL, Crust., Pycnog. und Arachn. von JAN MAYEN, l. c. p. 49.
1897. » » BIRULA, Essai d'une faune des crustacés décapodes etc., l. c. p. 424.
1899. *Spirontocaris polaris* SCOTT, Crust. Franz Josef Land, l. c. p. 63.
1900. » *polaris* STEBBING, Arctic Crustacea, l. c. p. 7.

1900. *Hippolyte polaris* DOFLEIN, Dekap. Krebse arkt. Meere, l. c., p. 334.
 1900. > *borealis* DOFLEIN, ibidem, l. c. p. 335.

Localities:

in 1898:

- stat. 5. lat. 75° 49' N., long. 24° 25' E., between Beeren Island and Hope Island, depth 80 m., bottom temp. — 1.48° C., rocky bottom, 21/VI, several spec.
- » 13. West Spitzbergen, Recherche Bay, off Fox Glacier, depth 75 m., stony bottom with dead shells and soft bluish-gray clay, 5/VII, one spec.
- » 20. West Spitzbergen, Ice Fiord, North Fiord, off Cape Wærn, depth 36 m., boulders Lithothamnium, with soft reddish-brown clay, 19/VII, one spec.
- » 22. lat. 68° 22' N., long. 14° 53' E., Ice Fiord, off Cape Bohe-
man, depth 40—50 m., 21/VII, many spec.
- » 24. Spitzbergen, Ice Fiord, 400 m., 24/VII, one spec.
- » 29. lat. 78° 40' N., long. 27° 10' E., King Charles Land, Swe-
dish Foreland, depth 14—16 m., bottom temp. + 0.9° C.,
fine, grayish-black sand, stones, mud, and algæ, 5/VIII,
seven spec.
- » 30. King Charles' Land, Swedish Foreland, depth 10—16 m.,
fin, grayish-black sand, stones, mud, and algæ, 6/VIII,
nine spec.
- » 32. King Charles' Land, Rival Sound, depth 100—110 m.,
bottom temp. — 1.45° C., soft clay with boulders, 8/VIII,
several spec.
- » 34. lat. 78° 50' N., long. 29° 39' E., King Charles' Land,
depth 60—70 m., soft grayish-black clay, 17/VIII, one
spec.
- » 35. lat. 80° 15' N., long. 33° 10' E., Giles land (White Is-
land), depth 40—50 m., rocky bottom, 18/VIII, two spec.
- » 36. lat. 80° 45' N., long. 25° 20' E., Charles XII Island, depth
60—70 m., rocky bottom with corallines, 20/VIII, one spec.
- » 38. lat. 79° 47' N., long. 14° 28' E., entrance of Liefde Bay,
depth 140 m., stony bottom with red algæ, 25/VIII, nu-
merous spec.
- » 39. lat. 79° 43' N., long. 10° 52' E., Danes Island, Virgo's
harbour, depth 25—30 m., gray mud, Laminariæ, 27/VIII,
several spec.
- » 42. lat. 73° 3' N., long. 18° 30' E., between Beeren Island
and Norway, depth 410 m., bottom temp. + 2° C., gray
clay, 4/IV, two spec.

in 1899:

- stat. 18. lat. 74° 52' N., long. 17° 16' W., depth 350 m., muddy
clay, sand, pebbles, 4/VII, four spec.

- stat. 21. lat 74° 10' N., long. 20° 8' W., S.E. of Clavering Island, depth 25—40 m., mud, abundant dead shells and pebbles, 17/VII, one spec.
- » 22. lat. 73° 30' N., long. 20° 18' W., Cape Broer Ruys, depth 25—27 m., gravels, some red algæ, 18/VII, one spec.
- » 23. lat. 73° 26' N., long. 21° 13' W., Cape Bennett, depth 9—11 m., sandy mud, algas, 19/VII, two spec.
- » 24. lat. 73° 20' N., long. 21° 20' W., depth 70 m., muddy bottom, some pebbles and dead shells, 21/VII, three spec.
- » 27. lat. 71° 35' N., long. 21° 10' W., depth 260 m., stones, mud, 27/VII, one spec.
- » 39. lat. 72° 45' N., long. 22° 56' W., depth 35—60 m., mud, some stones, 18/VIII, five spec.
- » 42. lat. 72° 56' N., long. 24° 33' W., King Oscar Fiord, depth 125 m., mud, some pebbles and sand, 24/VIII, two spec.
- » 43. lat. 73° 32' N., long. 24° 38' W., Kaiser Franz Joseph Fiord, Cape Weber, depth 100—110 m., mud with gravels and stones, 28/VIII, ten spec.
- North Spitzbergen, Danes Gat, depth 20—30 m., 7/VII, many spec. WULFF.
- North Spitzbergen, Treurenberg Bay, 10—20 m., 10/VIII, five spec., WULFF.

in 1900:

- stat. 2. West Spitzbergen, Ice Fiord, Coal Bay, depth 100 m., rocks, 16/VI—20/VI, det. LÖNNBERG.
- » 3. ibidem, depth 50—100 m., stones, 22/VI, det. LÖNNBERG.
- » 4. ibidem, off Coal Bay, depth 150—200 m., 23/VI; seven spec., det. LÖNNBERG.
- » 5. ibidem, Green Harbour, depth 10—80 m., stones, 25/VI, two spec.
- » 8. West Spitzbergen, Kings Bay, depth 10—30, stones and sand with Laminariæ, 29/VI, two spec.
- » 9. lat. 79° 10' N., long. 11° E., W. of Cape Mitra, depth 100 m., mud, 2/VII, two spec., det. LÖNNBERG.
- » 16. lat. 72° 25' N., long. 17° 56' W., E. of Greenland, depth 300 m., stones and sand, 30/VII, numerous spec. det. LÖNNBERG.
- » 17. East Greenland, Mackenzie Bay N. of Kaiser Franz Joseph Fiord, depth 12—35 m., mud, 1/VIII—3/VIII, many spec., det. LÖNNBERG.
- » 18. East Greenland, S. E. of Walrus Island, lat. 74° 30' N., long. 18° 40' W., depth 80—100 m., mud and stones, 4/VIII, det. LÖNNBERG.
- » 19. East Greenland, S.E. of Pendulum Island, lat. 74° 35' N., long. 18° 15' W., depth 150 m., mud and stones, 5/VIII, seven spec., det. LÖNNBERG.

- stat. 21. East Greenland, off Kaiser Franz Joseph Fiord between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, many spec., det. LÖNNBERG.
- » 22. East Greenland, Mackenzie Bay N. of Kaiser Franz Joseph Fiord, depth 12—18 m., mud, 9/VIII, one spec., det. LÖNNBERG.
- » 25. East Greenland, entrance of Kaiser Franz Joseph Fiord, depth 200—300 m., mud, 14/VIII, seven spec., det. LÖNNBERG.

As in the case of *Hippolyte Gaimardii* and, *H. gibba*, and that of *H. turgida* and *H. Phippsii*, GOËS first regarded SABINE'S *H. polaris* and OWEN'S *H. borealis* as identical. He says: Differentiam ullam specificam inter hanc *H. borealem* et *H. polarem* numquam percepi, nec hujus feminam inter copiam speciminum ditissimam inveni. GOËS' conclusion that *H. borealis* is the male of *H. polaris* was accepted by nearly all subsequent writers, such as SMITH, SARS, HANSEN, STEBBING etc. BUCHHOLZ who, in his important memoir cited above, and always characterized by great exactness, enumerates them as distinct species, however, says, about *H. polaris*: »Die grössten Exemplare vorzugsweise Weibchen, die Männchen durchschnittlich kleiner bis zu 50, oder höchstens 55 mm.» and about *H. borealis*: »Der vorigen *H. polaris* sehr nahe stehend und nur durch die sehr eigentümliche Form des Rostrum verschieden — — —. Zusammen mit der vorigen, von welcher sie vielleicht nur eine Abänderung ist, indessen viel weniger zahlreich. — — — Sämmtliche ostgrönländische Stücke sind Männchen — — —». After a careful examination of the great mass of material I have had at my disposal both now and some years ago, I fully agree with SMITH, who was the first to conclude that *H. borealis* represents »adult males, or perhaps more properly old males», while *H. polaris* are females and young males. Amongst recent writers, ORTMANN is the only one, as far as I know, who regards them as distinct species. ORTMANN says:¹ »Ob diese Art, *H. borealis*, als ♂ zu *H. polaris* gehört — — —, bleibt noch zu erweisen, da mir ein ♂ mit den Charakteren von *polaris* vorliegt.» The author had examined according to the list of localities given by him *H. polaris* a) 1 ♂ 1 ♀ Grönland, b) 1 ♀ Norwegen, Bergen, and of *H. borealis* a) 2 ♂ Ost-Grönland. I do not know if

¹ Decapoden Krebse. Strassburg. Museum, l. c. p. 502.

it is advisable to draw from this material, conclusions at variance with those of SMITH, SARS and others who have examined many hundred specimens, not withstanding the fact that these authors do not deny that *young* males agree in the form and armament of the rostrum and in the possession of a pterygostomian spine.¹

SMITH regards *Hippolyte cultellata*, and DOFLEIN *H. amazo* PFEFFER as synonymous, in which view they are, no doubt, right.

Hippolyte polaris is strictly circumpolar and arctic. It has been found on both sides of Davis Strait, Baffin Bay, and Smith Sound, along the coasts of Labrador, Nova Scotia, and New England as far south as Massachusetts Bay, Behrings Straits, Franz Joseph Land, Kara Sea, Nova Zembla, Spitzbergen, Beeren Island, Norway, Bohuslän, North Sea.

The largest specimens which I have examined were obtained round King Charles Land and from East Greenland at a depth of 100—200 m. which agrees with observations made by HANSEN and, recently, by DOFLEIN. It has been taken in depths ranging from a few up to 260 fathoms.

Length of largest spec. (from East Greenland) 89 mm.

21. *Hippolyte groenlandica* (J. C. FABRICIUS).

- 1775. *Astacus Groenlandicus* J. C. FABRICIUS, *Systema Entomologiæ*, p. 416.
- 1780. *Cancer aculeatus* O. FABRICIUS, *Fauna Groenlandica*, p. 239, n:o 217.
- 1840—41. *Hippolyte aculeata* KRÖYER, *Uds. nord. Art. Slægt. Hippolyte*, l. c. p. 578.
- 1842. » » KRÖYER, *Monogr. Fremst. Slægt. Hippolytes nord. Art.*, l. c. p. 334, tab. IV, fig. 83—98, tab. V, fig. 99—104.
- 1874. » » BUCHHOLZ, *Crust. Zweite deutsche Nordpolarfahrt*, l. c. p. 276.
- 1879. » » SMITH, *Stalk-eyed Crust. Atl. Coast of North America*, l. c. p. 85.

¹ DOFLEIN, l. c. p. 335, seems at first to have the same opinion as his German collega, but says: »Während ich im Beginn der Bearbeitung des Materials gegen diese Auffassung (von SARS, SMITH, RICHTERS u. a.) Stellung nehmen zu müssen glaubte, habe ich mich schliesslich noch während der Drucklegung des Manuskriptes zu ihr bekehrt; daher konnte ich die Arten nicht mehr zu der einen (*H. polaris* SAB.) nach dem Prioritätsgesetz zusammenziehen.»

Localities:

in 1899:

- stat. 22. lat. 73° 30' N., long. 20° 18' W., Cape Broer Ruys, depth 25—27 m., gravels, some red algæ, 18/VII, one spec.
 » 39. lat. 72° 45' N., long. 22° 56' W., depth 35—60 m., mud, some stones, 18/VIII, six spec.

in 1900:

- stat. 17. East Greenland, Mackenzie Bay N. of Kaiser Franz Joseph Fiord, depth 12—35 m., mud, 1/VIII—3/VIII, det. LÖNNBERG.
 » 22. East Greenland, ibidem, depth 12—18 m., mud, 9/VIII, det LÖNNBERG.

This large and easily-recognizable species was first described by J. C. FABRICIUS as *Astacus Groenlandicus* and, five years later, by O. FABRICIUS as *Cancer aculeatus*. Both names are very appropriate, although the first must have priority. It seems to be restricted, in its horizontal distribution, mainly to the seas about Greenland. It occurs numerously along the West Coast of Greenland as far north as lat. 82° 30' N., along the West coast of Baffin Bay and Davis Strait and, farther south, to Massachusetts Bay. It is also recorded from Behring Sea and the Polar Archipelago of North America.¹ Although BUCHHOLZ says that it is »an der ostgrönländischen Küsten häufig und wie es scheint ziemlich allgemein verbreitet», it must be remarked that it was obtained here only at four stations out of more than sixty where dredgings were carried on by the Swedish Expeditions in 1899 and 1900.

It ranges bathymetrically from a few fathoms to 200, and it seems to live on very variable bottom.

Length of largest spec. (a female with roe) 92 mm. HANSEN has measured a specimen, in the Museum of Copenhagen, of a length of 113 mm. SMITH has given, in his paper, cited above, some details as to the colour.

¹ Also on the Pacific coast of North America, it is found as far south as Puget Sound. (CALMAN, Crust. fr. Puget Sound, l. c. p. 260.)

Pandalus LEACH 1814.

22. Pandalus borealis KRÖYER.

Fig. 2.

- 1838—39. *Pandalus borealis* KRÖYER, *Consp. Crust. Groenl.*, l. c.
p. 254.
1844—45. » » KRÖYER, *Karcinol. Bidr.*, l. c. p. 461.
1846 (?). » » KRÖYER, *Voy. in Scand. etc.*, pl. 7,
fig. 2 a—o.

Localities:

in 1898:

- stat. 9. lat. 76° 46' N., long. 15° 22' E., off Horn Sound, depth 210 m., bottom temp. + 2,83° C., soft, grayish-black clay, 26/VI, several small spec.
» 21. lat. 78° 27' N., long. 15° 20' E., Ice Fiord, North Fiord, between Cape Wærn and Cape Thordsen, depth 175 m., soft, reddish-brown clay, 19/VII, one spec.
» 24. West Spitzbergen, entrance of Ice Fiord, depth 400 m., bottom temp. + 3° C., 24/VIII, (failure) three spec.
» 25. lat. 78° 4' N., long. 11° 37' E., 12' S. af King Charles Land, depth 240 m., bottom temp. + 3,15° C., pebbles with soft, grayish-black clay, 24/VII, two spec.
» 37. lat. 81° 14' N., long., 22° 50' E., N.E. of Seven Islands, depth 150 m., bottom temp. + 2° C., gray clay, 20/VIII, six small spec.
» 40. lat. 79° 58' N., long. 9° 30' E., 19—20 miles N.W. of Danish Island, depth 435 m., bottom temp. + 1,5° C., gray clay, boulders, 27/VIII, one spec. (mutilated).
» 42. lat. 73° 3' N., long. 18° 30' E., between Beeren Island and Norway, depth 410 m., bottom temp. + 2° C., gray clay, 4/IX, several spec.

in 1899:

- stat. 1. lat. 61° 16' N., long. 1° 18' E., depth 150 m., sand, some stones and dead shells, 31/V, one small spec. (mutilated).

in 1900:

- stat. 6. entrance of Ice Fiord, West Spitzbergen, depth 350 m., mud, 26/VI, det. LÖNNBERG.
» 9. lat. 79° 10' N., long. 11° E., W. of Cape Mitra, West Spitzbergen, depth 100 m., mud, 2/VII, det. LÖNNBERG.

The absence of chelæ of the first pair of pereopods has hitherto, as far as is known, been regarded as one of the most

important characteristics of *Pandalus*. CAULLERY was the first who called attention to the fact that, amongst the true *Pandalids*, there is an exception to this rule. In his paper on »Crustacés Schizopodes et Décapodes» de la Campagne du »Caudau» dans le Golfe de Gascogne, l. c. p. 379, he has described a new species provided with minute chelæ on the first pair of pereopods. On this character he established with full right a new subgenus *Dichelopandalus*, but, at the same time, he suspects that this chela may also be found among other species. His advice to keep a look-out for such species has been followed by CALMAN, who was able to state the existence of such in no less than seven other species.¹ Also in *Pandalus borealis* he found a chela. In fig. 2 I have figured it. Strictly speaking, this species should therefore be included in the genus *Dichelopandalus*, but as there is good reason to believe that, on a closer examination, still more species will be found to possess this characteristic (which, after the finds of CALMAN, does not seem to be of a very high generic value) I prefer to retain the old name.

Distribution: West Greenland up to 70° 40' N. (HANSEN), East coast of North America, Behring Sea, Barents Sea, Spitzbergen, Norway, south to Cattegat. It is generally considered to be a true arctic and circumpolar species; but I only wish to call attention to the fact that, during our three last Swedish Expeditions, as seen above, it was not obtained either E. of Spitzbergen, or along the coast of East Greenland, whereas it was taken in considerable numbers in suitable depths, off West Spitzbergen. Also, during the German expeditions on board »Helgoland» and »Olga», it was only obtained in Ice Fiord, the Hinlopen Strait, and at the entrance of the White Sea. In none of my stations was the bottom temperature below zero, and all are situated within the area where the Gulf Stream prevails. Even Hinlopen Strait is, at least in some years, influenced by this warm current, as is already shown by WALTHER and KÜKENTHAL. It is a very remarkable fact that neither I nor SCHAUDINE nor RÖMER obtained any single specimen farther eastwards, round King Charles Land, during our numerous trawlings; but, at least in the summer of 1898, the bottom temperature was, in that tract of the

¹ CALMAN, on the British *Pandalidæ*, l. c. p. 28.

Arctic Ocean, generally below zero. This circumstance inclines me to believe that *Pandalus borealis* ought not to be regarded as a true Arctic form, but rather as an North Atlantic (and North Pacific) species. In this view I am confirmed by the circumstance that it has not as yet been obtained along the East coast of Greenland, in Smith Sound, or along the West coast of Baffin Land, where the Arctic Current is sweeping south.

Pandalus borealis is mostly found in depths varying from 100 to 500 m. Whether it lives or not at the very bottom, is an open question. It is, in my opinion, very probable that, perhaps during the most part of its life, like many other decapods and schizopods, it swims in great shoals in the deeper strata of the water, and is only occasionally found creeping along the bottom. In proof of this I may mention that I once got, at station 24 in 1898, some large specimens, although the great trawl had capsized, so that true bottom-animals did not come up. However, the trawl had reached the bottom, inasmuch as there some clay was adhering to it. However, I never got this species in the vertical plankton net, but that must be explained simply by the great swiftness of this animal, which very easily escapes the relatively small opening of the net.

As to the *colour*, I refer to SMITH, Stalk-eyed Crustaceans of the Atlantic Coast of North America, l. c. p. 86.

Length of one of the largest specimens 122 mm. The largest specimen HANSEN measured, reached a length of 129 mm.

Fam. Pasiphaeidae.

Pasiphaea SAVIGNY 1816.

23. Pasiphaea tarda KRÖYER.

- 1844—45. *Pasiphaea tarda* KRÖYER, Karcinol. Bidr., l. c. p. 453.
 1846. » » KRÖYER, Voy. on Scand. etc., pl. 6, fig.
 1. A. B. a—o.
 1868. *Pasiphaea norvegica* M. SÆRS, Bidr. til Kundsk. etc., l. c.
 p. 282, tab. IV, V, fig. 81, 87—90.
 1877. » *tarda* G. O. SÆRS, Prodr. descr. Crust. etc., l.
 c. p. 242.

1879. *Pasiphaë tarda* SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 88, pl. X, fig. 1.
 1882. » » G. O. SARS, Overs. af Norges Crust. etc., l. c. p. 48.

Localities:

in 1900:

- I. lat. 73° 30' N., long. 2° W., depth 3000—0 m., vertical net, two spec.
 II. lat. 73° N., long. 2° W., depth 1500—0 m., vertical net, 13/VII, one spec.
 III. lat. 73° 15' N., long. 2° 50' W., depth 3000—0 m., vertical net, one spec.

This species, which is very closely allied to the type of the genus, viz. *Pasiphæa sivado* (Risso). has been obtained at: »South Greenland», »Greenland» (only three specimens are, according to HANSEN, as yet known from that sea, two of which are KRØYER's type specimens), Irminger Sea, off West coast of Norway very far from land, Gulf of Maine, 42 miles E. by S. from Cape Ann.

Length of greatest spec. 56 mm.,

» » antennæ 122 mm.

As to the identity of *Pasiphæa tarda* and *Pasiphæa norvegica*, I refer to G. O. SARS' papers cited above.

Fam. Ephyridæ.

Hymenodora SARS 1877.

24. Hymenodora glacialis (BUCHHOLZ).

1874. *Pasiphaë glacialis* BUCHHOLZ, Crust. Zweite Deutsche Nordpolarfahrt etc., l. c. p. 279.
 1877. *Hymenodora* » G. O. SARS, Prods. descript. Crust. etc., l. c. p. 240.
 1885. » » G. O. SARS, Norw. North. Atl. Exp. Crust. I., p. 37, pl. 4.
 1885. » » SMITH, On some new or little known Decapod Crustacea etc., l. c., p. 501.

Localities:

in 1898:

stat. 26. lat. $77^{\circ} 39' N.$, long. $1^{\circ} 17' E.$, »the Swedish Depth», depth 3200 m., bottom temp. — $1.4^{\circ} C.$, Biloculina clay, 27/VII, six spec.

in 1899:

stat. 3. lat. $63^{\circ} 36' N.$, long. $0^{\circ} 26' E.$, depth 1900 m. 2/VI, nine spec.

in 1900:

- stat. 21. East Greenland, off Kaiser Franz Joseph Fiord between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, det. LÖNNBERG.
- » 29. lat. $72^{\circ} 42' N.$, long. $14^{\circ} 49' W.$, between Greenland and JAN MAYEN, depth 2000 m., clay with foraminifers, 27/VIII, det. LÖNNBERG.
- » lat. $73^{\circ} 15' N.$, long. $2^{\circ} 50' W.$, depth 3000—0 m., vertical net, many spec., det. LÖNNBERG.
- » lat. $72^{\circ} 50' N.$, long. $3^{\circ} 8' W.$, depth 2700—0 m., vertical net, det. LÖNNBERG.
- » lat. $71^{\circ} 18' N.$, long. $9^{\circ} 20' W.$, depth 2000—0 m., vertical net, det. LÖNNBERG.

This beautiful species was first described by BUCHHOLZ on a specimen floating on the surface not far from the pack-ice in about lat. $74^{\circ} N.$, off the East coast off Greenland. He referred it to *Pasiphaea*, to which it has a certain resemblance. On the Norwegian North Atlantic Expedition it was obtained at 14 stations, all situated in the cold area between about lat. $80^{\circ} N.$ and lat. $63^{\circ} S.$, and between the longitudes of Spitzbergen, Beeren Island, Norway, on the one side, and East Greenland, Jan Mayen, Iceland, on the other. SARS was then enabled to give a fuller description of this bathypelagic decapod. In the same year, 1885, SMITH records it as also occurring in the deeper places of an area off the East coast of United States, between lat. $35^{\circ} 45' N.$, and lat. $40^{\circ} 26' N.$, and between long. $67^{\circ} 5' W.$ and long. $74^{\circ} 31' W.$ in depths ranging from 861 to 2949 fathoms. It was also obtained during the »Fram» Expedition in about lat. $80^{\circ} N.$, long. $134^{\circ} E.$ the tow-net having been lowered to a depth of 300 metres. SARS' specimens were all captured in depths varying from 452 to 1862 fathoms. The smallest depth from

which it has been taken is 250 metres in stat. 21, 1900. But these figures give, of course only, an approximate value, and it is only by means of shutting nets that we might expect to get certain information as to its bathymetrical range.

One specimen was infested by the parasitic cirrhiped, *Sylon hymenodoræ* G. O. SARS.

Colour bright red.

Length of largest spec. 69 mm.

Schizopoda.

Fam. Euphausiidæ.

Nyctiphanes G. O. SARS 1883.

This genus was instituted by SARS, in his »Preliminary Notices on the Schizopoda of H. M. S. »Challenger» Expedition», to receive the Northern *Thysanopoda Couchii* BELL and *Thysanopoda norvegica* M. SARS and a new nearly related form, viz. *Nyctiphanes australis* from Bass' Strait. It is mainly characterized by a membraneous reflexed leaflet on the basal joint of the antennulæ, and by the rudimentary and dissimilar state of the two hindmost pairs of legs.

25. *Nyctiphanes norvegica* (M. SARS).

1857. *Thysanopoda norvegica* M. SARS, Om 3 nye norske Krebsdyr, l. c. p. 169.
 1864. » » M. SARS, Udførlig Beskrivelse etc., l. c. p. 2.
 1864. » nana M. SARS, Tillæg til etc., l. c. p. 84.
 1878. » Norvegica SMITH, Stalk-eyed Crust. Atl. Coast North America etc., l. c. p. 89.
 1885. *Nyctiphanes* » G. O. SARS, Norweg. North Atl. Exp. II, p. 12.

1886. *Nyctiphanes Norvegica* KOELBEL, Crust., Pycnog. und Arachn. von Jan Mayen etc., l. c. p. 48, taf. III, fig. 7—10.
 1892. » *norvegica* NORMAN, Families Lophogastridæ and Euphausiidæ etc., l. c. p. 459.
 1892. » » STEBBING, Hist. Crustacea, l. c. p. 263.

Localities:

in 1898:

- stat. 41. lat. 75° 58' N., long. 13° 18' E., 56 miles S.W. of South Cape, Spitzbergen, depth 350 m., bottom temp. + 2,73° C., grayish clay, 1/IX, one spec.

in 1899:

- stat. 3. lat. 63° 36' N., long. 0° 26' E., depth 1900 m., 2/VI., many spec.

in 1900:

- stat. 21. East Greenland, off Kaiser Franz Joseph Fiord between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, one spec.
 » 29. lat. 72° 42' N., long. 14° 49' W., between Greenland and Jan Mayen, depth 2000 m., clay, 27/VIII, many spec.
 » II. lat. 73° 30' N., long. 2° W., depth 1500—0 m., vertical net, 13/VII, one spec.

Distribution: This beautiful species seems to be widely distributed both in the North Atlantic Ocean and in the adjacent parts of the Arctic. It has been obtained during the »Porcupine» Expedition off the coast of Portugal. NORMAN mentions it from the Bay of Biscay and from the British Isles, and SARS from the whole of the Norwegian coast, where it occurs, in some localities, at the surface, in such vast swarms that the sea gets thereby a peculiar brownish tint. SMITH states the same fact on the east coast of New England and Nova Scotia, where it goes as far south as Massachusetts Bay. BUCHHOLZ and HANSEN enumerate it from the sea E. of Greenland, KOELBEL from Jan Mayen, and GOËS from Bohuslän and lat. 75° N., long. 12° E. It also occurs in Færøe Channel (MURRAY *vide* NORMAN) and off the Naze (METZGER). SARS reports it from the North Polar Basin, where it was taken during the famous »Fram» Expedition.

Strangely enough, it was not obtained either on the Challenger Expedition or on the German Plankton Expedition.

G. O. SARS says¹: »May be the British form, *Thysanopoda Couchii*, observed by BELL, is identical with the present species.» NORMAN has, however, clearly proved that *Nyctiphanes Couchii* is a very distinct species, nearly related to *Nyctiphanes australis* G. O. SARS from Bass' Strait, Australia.

Length 37 mm.

Rhoda SIM 1872.

(= *Boreophausia* G. O. SARS 1883).

STEBBING is the first who, in his »History of Crustacea», pointed out that two Northern Euphausiids, viz. the well-known *Thysanopoda inermis* KRÖYER and a closely-allied form *Thysanopoda Raschii* M. SARS, ought strictly to be referred to the genus *Rhoda*, established in 1872 by G. SIM in his paper on »Stalk-eyed Crustacea N. E. Coast of Scotland», published in »the Scottish Naturalist». The genus was created to receive a species, viz. *Rhoda Jardineana*, which NORMAN identifies with *Thysanopoda Raschii*. SARS, in his »Preliminary Notices on the Schizopoda of H. M. S. »Challenger» Expedition», established for KRÖYER's *Thysanopoda inermis* a new genus, viz. *Boreophausia*, but without giving any generic diagnosis. Two years afterwards he added² to this genus *Thysanopoda neglecta* KRÖYER and *Thysanopoda Raschii* M. SARS and, with some hesitation, *Thysanopoda longicaudata* KRÖYER. Of these species, *Thysanopoda Raschii* is the only one that ought properly to be referred to *Boreophausia*, the other two belonging, according to HANSEN and NORMAN, to the genus *Thysanoëssa*, established by BRANDT in 1851. Since *Rhoda Jardineana* has proved to be identical with *Boreophausia Raschii*, SARS' genus must yield priority to the much older name *Rhoda*. The genus thus includes *Rhoda inermis* (KRÖYER) and *Rhoda Raschii* (M. SARS).

¹ l. c. p. 12.

² Norweg. North Atlant. Exp. II, p. 13. Rep. Challenger Exp., p. 64.

26. *Rhoda inermis* (KRÖYER).

1846. *Thysanopoda inermis* KRÖYER, Voy. in Scand. etc., p. 7, fig. 2 a—t.
 1859. » » KRÖYER, Monograph, Fremstilling of Sergestes, l. c. p. 294, tab. V, fig. 24.
 1879. » » SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 91.
 1882. *Euphausia* » G. O. SARS, Overs. Norges Crust. etc., l. c. p. 51, tab. I, fig. 15.
 1886. » » KÖRBLER, Crust., Pycnog. und Arachn. von Jan Mayen etc., l. c., p. 47.
 1887. *Boreophausia* » HANSEN, Ofv. vestl. Grönlands Fauna etc., l. c. p. 53.
 1887. » » HANSEN, Dijnphna-Togtets zool. bot. Udbytte etc., l. c. p. 253, tab. XXIII, fig. 3.
 1892. » » NORMAN, Families Lophogastridæ and Euphausiidæ etc., l. c. p. 461.
 1893. [*Boreophausia*] *Rhoda inermis* STEBBING, Hist. Crustacea, l. c. p. 263.
 1900. *Rhoda inermis* STEBBING, Arctic Crustacea, l. c. p. 11:

Localities:

in 1899:

- stat. 3. lat. 63° 36' N., long. 0° 26' E., depth 1900 m., 2/VI, four spec. (together with *Nyctiphanes norvegica*).
 » 26. lat. 72° 26' N., long. 21° 48' W., depth 180—0 m., vertical net, 24/VII, three spec.
 » 27. lat. 71° 35' N., long. 21° 10' W., depth 200—0 m., vertical net, 27/VII, three spec.
 » 43. lat. 73° 32' N., long. 24° 38' W., Kaiser Franz Joseph Fiord, Cape Weber, depth 100—110 m., mud with gravels and stones, 28/VIII, one spec.

in 1900:

- West Spitzbergen, entrance of King's Bay, depth 300—0 m., trawl, 2/VII, many spec.
 stat. 16. lat. 72° 25' N., long. 17° 56' W., E. of Greenland, depth 300 m., stones and sand, 30/VII, one spec.
 » 21. East Greenland, off Kaiser Franz Joseph Fiord, between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, several spec.
 » 29. lat. 72° 42' N., long. 14° 49' W., between Greenland and Jan Mayen, clay, depth 2000 m., 27/VIII, three spec.

Rhoda inermis has more or less the same distribution as the preceding species, which it rivals also in number of specimens. It is restricted to the boreal parts of the North Atlantic and its continuation northwards. It occurs off the British Isles, West- and North-Norway, Kara Sea, Spitzbergen, Jan Mayen, East- and West-Greenland, and the coast of New England as far south as Vineyard Sound and Massachusetts Bay.

It does not attain such a size as *Nyctiphanes norvegica*. My largest specimen measured 29 mm.

Thysanoëssa BRANDT 1851.

This genus was established by BRANDT in MIDDENDORFF'S Sibirische Reise with the following diagnosis. Penum maxillarium par externum reliquis pedibus longius. It included *Thysanopoda* (*Thysanoëssa*) *longipes* BRANDT which has proved to be identical with *Thysanopoda neglecta* KRÖYER. Another species figured but not described by KRÖYER, in »Voyage en Scandinavie etc.», is also referred to this genus, viz., *Thysanopoda longicaudata*. In 1882 SARS described two more species from the coasts of Norway, viz. *Thysanoëssa borealis* and *Thysanoëssa tenera*, but HANSEN, who has examined KRÖYER'S type-specimens, preserved in the Museum of Copenhagen, comes to the conclusion that *Thysanoëssa borealis* must be identified with *Thysanopoda neglecta*, and *Thysanoëssa tenera* with *Thysanopoda longicaudata*. In the »Challenger reports», SARS has added two new species to the genus, viz. the cosmopolitan *Thysanoëssa gregaria* and *Thysanoëssa macrura* from the Antarctic and South Atlantic Oceans. The genus which is closely allied to *Nematoscelis* G. O. SARS and *Stylocheiron* G. O. SARS is, in its present restriction, distinguishable, according to SARS, by the following characteristics: first pair of legs greatly produced and rather strong, the two last joints armed with spiniform bristles on both margins.

During the Swedish Arctic Expeditions of the last three summers only the following species was obtained, viz.

27. *Thysanoëssa longicaudata* (KRÖYER).

1846. *Thysanopoda longicaudata* KRÖYER, Voy. en Scand. etc., l. c. p. 7, fig. 1 a—f.
 1882. *Thysanoëssa tenera* G. O. SARS, Ofv. Norges Crust. etc., l. c. p. 53, tab. I, fig. 19—20.
 1887. » *longicaudata* HANSEN, Ofv. vestl. Grönl. Fauna etc., l. c. p. 54.
 1892. » » NORMAN, Lophogastridæ and Euphausiidæ etc., l. c. p. 463.
 1893. » » STEBBING, Hist. Crustacea etc., l. c. p. 265.
 1893. » » ORTMANN, Decapoden und Schizopoden d. Plankton-Exp., l. c. p. 14.
 1900. » » SARS, Norweg. North Polar Exp. 1893—1896. Crustacea, p. 14.

Locality:

in 1900:

- II. lat. 73° 30' N., long. 2° W., depth 1500—0 m., vertical net, 13/VII, one spec.

This species has been obtained off the Western and Northern coasts of Norway, off Scotland, in the Færøe Channel, off Greenland (»Valorous' Exp.» *vide* NORMAN), in the North Polar Basin, in the sea between Norway and Jan Mayen, and at several stations of the German Plankton Expedition situated resp. in the areas of the Gulf Stream, the Irminger Sea, the West Greenland Current, and the Labrador Current. KRÖYER's type specimens are from lat. 61° N., long. 13° W., and from lat. 60° N., long. 11° W. The main distribution of this species seems, therefore, to be, the Arctic parts of the North Atlantic.

Length: 15,5 mm.

Fam. Mysidæ.

Boreomysis G. O. SARS 1869.

This genus was instituted in 1869 by G. O. SARS in his »Undersøgelser over Christianiafjordens Dybvandsfauna» to receive *Mysis arctica* KRÖYER, which, at that time, was only

known from a single specimen from Greenland. Later on, in his classical »Monographi over de ved Norges Kyster forekommende Mysider», III. 1879, the same author gave a full diagnosis of the genus. He considers the structure of the marsupium in the female as its most distinctive feature, this being here composed of seven pairs of lamellæ, whilst, in all other Mysideans, it is formed by three pairs at the utmost.

Petalophthalmus WILLEMOES-SUHM is the only one that shares that characteristic with *Boreomysis*. Besides that, the structure of thep leopods in the male being all natatory, with very elongate branches, and the rudimentary auditory apparatus make the genus very distinct. In the same genus he included two other species also occurring in the deepest parts 100—400 fathoms of the Norwegian Fiords, viz., *Boreomysis tridens* G. O. SARS, and *Boreomysis megalops* G. O. SARS. On the Norwegian North Atlantic Expedition were obtained the two species to be mentioned below; and, in his report on the Challenger Schizopoda, SARS added two more species to the genus, viz. *Boreomysis obtusata* and *Boreomysis microps* from the North Pacific and North Atlantic resp., both from considerable depths. Thus the genus comprises, at present, seven species, all of which are probably bathypelagic forms.

28. *Boreomysis nobilis* G. O. SARS.

Fig. 3.

1879. *Boreomysis nobilis* G. O. SARS, Crust. et Pycnogon. nova etc., l. c. p. 428.
 1885. » » G. O. SARS, Norweg. North Atl. Exp. I, p. 54, pl. 5, fig. 22—28.
 1887. » » HANSEN, Ofv. vestl. Grönlands Fauna etc., l. c. p. 214.

Localities:

in 1900:

- stat. 21. East Greenland, off Kaiser Franz Joseph Fiord between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, several spec.
 » 25. East Greenland, entrance of Kaiser Franz Joseph Fiord, depth 200—300 m., mud, 14/VIII, three spec.

The species was described after a single specimen (a male) obtained during the Norwegian North Atlantic Expedition in lat. $79^{\circ} 59' N.$, long. $5^{\circ} 40' E.$ from a depth of 839 metres. Two other localities are recorded by HANSEN for this species, viz. lat. $69^{\circ} 15' N.$, long. $52^{\circ} 55' W.$, and lat. $75^{\circ} 26' N.$, long. $67^{\circ} 27' W.$, both, thus, situated, in the northern part of Baffin Bay. The depths were 265 and 260 fathoms resp. I have not been able to find any other records of its occurrence. It may, therefore, be regarded as an inhabitant of the deep-sea of the Atlantic part of the Arctic Ocean.

The oral parts do not deviate from the structure, which is to be found in the type species, viz. *Boreomysis arctica* (KRÖYER) as described and figured by SARS in his »Carcinologische Bidrag». The molar part of the mandible, the maxillæ and the maxillipeds closely agree with the corresponding parts in the said species, but deviate more from those in the following species. The last joint of the palp of the mandible slightly deviates as may be seen by comparing SARS' and my own figures of it. As SARS' specimen of *Boreomysis nobilis* had the uropoda somewhat mutilated, I give herewith a figure of them.

Length of largest male 45 mm.

» » » female 49 mm.

29. *Boreomysis scyphops* G. O. SARS.

Petalophthalmus inermis WILLEMOES-SUHM MS.

1879. *Boreomysis scyphops* G. O. SARS, Crust. et Pycnogon. nova etc., l. c. p. 429.
 1884. » » G. O. SARS, Prelimin. Not. Schizop. Chall. Exp., l. c. p. 34.
 1885. » » G. O. SARS, Norweg. North Atl. Exp. I., p. 56, pl. 6.
 1885. » » G. O. SARS, Schizopoda, Chall. Rep., l. c. p. 178, pl. XXXII, fig. 10—20.

Localities:

in 1898:

- stat. 26. lat. $78^{\circ} 19' N.$, long. $8^{\circ} 41' E.$, »Swedish Depth», depth 2700 m., bottom temp. — $1,4^{\circ} C.$, Biloculina clay, 25/VII, six spec. (more or less mutilated).
 » 27. lat. $77^{\circ} 52' N.$, long. $3^{\circ} 5' W.$, 40 miles S.W. of the »Swedish Depth», depth 2750 m., bottom temp. — $1,4^{\circ} C.$, Biloculina clay, 29/VII, two spec.

in 1900:

stat. 29. lat. $72^{\circ} 42'$ N., long. $14^{\circ} 49'$ W., between Greenland and Jan Mayen, depth 2000 m., clay with foraminifers, 27/VIII, many spec.

This easily-recognizable form was, for the first time, recorded by the late WILLEMOES-SUHM who referred it to *Petalophthalmus* on account of the resemblance, in respect to the rudimentary eyes, between this species and *Petalophthalmus armiger* — also obtained at a very considerable depth during the Challenger Expedition and described by the same distinguished zoologist. On the Norwegian North Atlantic Expedition the same species was also trawled, described, and figured by SARS, who, after the working-up of the material of Challenger Schizopoda, was not able to find any differences between the Arctic and Antarctic specimens. He also proved that the species must be referred to *Boreomysis*, and, in his Challenger Report, he explains the reasons why he thinks it inadvisable to adopt WILLEMOES SUHM's specific name, although it can justly claim priority.

Besides its very striking peculiarities in structure, this species is also of the utmost interest with regard to its geographical distribution. Up to now it has been obtained at three stations on the Challenger Expedition between lat. $46^{\circ} 16'$ S. and lat. $53^{\circ} 55'$ S. on the one side, and between long. $48^{\circ} 27'$ E. and long. $123^{\circ} 4'$ E. on the other, the depths varying from 1600 to 1950 fathoms. During the Norwegian North Atlantic Expedition it was obtained at lat. $71^{\circ} 59'$ N., long. $11^{\circ} 40'$ E. from a depth of 1110 fathoms. These are, as yet, the only localities recorded for this species, besides those enumerated by me from the last Swedish expeditions. But it has hitherto been obtained in no other place in the intermediate tropical seas. Thus, it seems to be a »bipolar» form, to which animals two other *Schizopoda* may also belong, viz. the Arctic *Lophogaster typicus* M. SARS, obtained by the »Challenger» at two stations south of the Cape of Good Hope and *Amblyops Crozetii* WILLEMOES-SUHM represented in the Challenger collection by a single specimen from Crozet Island, and now rediscovered in the Arctic Ocean by the Swedish Expedition of 1900 (*vide infra*). The explanation of such strange occurrences belongs, without doubt, to the most

interesting problems yet to be solved by zoogeographers, but, I think, we shall have to wait a long time, before this intricate question can be satisfactorily settled.

SARS' descriptions of the species are so exhaustive that I have nothing to add to them. Specimens preserved in a mixture of formol and alcohol still exhibit the bright red colour of the body. The eyescales, the carapace, the antennæ and the legs are whitish.

Length of greatest specimen (a female) 62 mm.

or from the tip of the antennal scale to that of the uropod 78 mm.

The largest specimen which SARS measured in this way was 85 mm. long. It was obtained in the Southern Ocean.

Amblyops G. O. SARS 1872.

Amblyopsis G. O. SARS, 1869 (preoccupied).

This genus was first brought to the notice of the scientific world in 1869 by G. O. SARS, in his »Undersøgelser over Christianiafjordens Dybvandsfauna», to receive a Mysidean closely allied to *Pseudomma*, and first mentioned in 1868 by the great Norwegian carcinologist's illustrious father in his »Fortsatte Bemærkninger over det dyriske Livs Utbredning i Havets Dybder»¹ under the name of *Pseudomma abbreviatum* G. O. SARS. In Heft 2 of his »Carcinologiske Bidrag til Norges Fauna» G. O. SARS has more fully described and figured this species, which was obtained by him in depths ranging from 100 up to 300 fathoms at several places on the coast of Norway. e. g. off Lofoten, in the Hardanger- and Christiania-Fiords. The same author afterwards added to this genus, in his report on the Challenger Schizopoda, another form from the Southern Ocean off Crozet Islands, of which species, however, only a single specimen — an adult male — was obtained. To my great surprise, I rediscovered five specimens, viz. four males and one female, of this species from a station of the Swedish Arctic Expedition, 1900, together with a number of the bathypelagic *Boreomysis scyphops*. I am unable to

¹ Forh. Vid. Selsk. Christiania, Aar 1868, p. 262.

detect any differences whatever between the Southern and Northern form, so that I must consider them as being absolutely identical. In a short notice on »A new »bipolar» Schizopod», published in the Ann. Mag. Nat. Hist. for this year (Ser. 7, Vol. VII, p. 371), I have pointed out the great geographical interest which is connected with this find. As I have also one female at my disposal, I am here able to complete Sars' description.

I refer to this genus another very characteristic form brought home by the same expedition, although it deviates from it in some points.

30. *Amblyops Crozetii* WILLEMOES-SUHM. MS.

	<i>Amblyops crozetii</i>	WILLEMOES-SUHM M. S.
1884.	»	G. O. Sars, Prelim. Not. Schizopoda »Challenger» Exp., l. c. p. 36.
1885.	»	G. O. Sars, Schizopoda, Chall. Rep., l. c. p. 186, pl. XXXIII, fig. 11—16.

Locality:

in 1900:

stat. 29. lat. 72° 42' N., long. 14° 49' W., between Greenland and Jan Mayen, depth 2000 m., clay with foraminifers, 27/VIII, five spec. (4 ♂, 1 ♀).

In general appearance and in nearly all details my specimens perfectly agree with the description and figures given by Sars in the »Challenger» Report. I am only able to find very slight differences in a few respects. Thus, the insinuation of the end of the telson is, in the Northern specimens, a little more pronounced, and the antero-lateral corners of the eye-scales more rounded.

In the structure of the oral parts this species closely resembles *Amblyops abbreviata*. There are, however, a few differences of minor importance: the third joint of the palp of the mandible is relatively longer than in last species; also the last joint of the second pair of maxillæ is, along its exterior margin, provided with 12 ciliated bristles instead of six, as Sars mentions for *A. abbreviata*. The basal joint of the first pair of maxillipeds has at its extremity a similar prominence

as in this species. Last joint (with the claw) of the second pair of maxillipeds is of more than half the length of the preceding joint. In *A. abbreviata* it is much shorter. Pereiopods and pleopods of the usual structure.

As mentioned above, a single specimen of *Amblyops Crozetii* was taken in the Southern Ocean off Crozet Islands in lat. 46° 16' S., long. 48° 27' E. at a depth of 1600 fathoms. The find of it in the Arctic Ocean was, therefore, very surprising and seems, in my opinion, to corroborate the view of CHUN that a communication of animals still exists in the deeper or abyssal strata of the oceans between the Arctic and Antarctic seas. However, further researches in the far Southern Ocean afford the only means of fully settling the interesting problem of 'bipolarity'.

Length of male: 26 mm., of female 25 mm.

31. *Amblyops Sarsii* n. sp.

Fig. 4.

Carapace submembranaceous, covering whole pereion except the hindmost segment. Sixth segment of pleon as long as the three preceding ones. The anterior, or cephalic, part of the carapace is marked off by a distinct sulcus and arched above. The frontal margin ends in an angle, which, seen *en profile*, seems to form a short, somewhat upturned rostrum. The antero-lateral corners evenly rounded.

The eye-scales, or ocular plates, as compared with those in the other species of the genus, rather small, not contiguous, with a free space between them. They are of an almost quadrate form, with a sharp line running along the lateral side. The upper side with a short styliform process visible from above and from the medial side. The anterior-inferior margin is rounded off.

The peduncular joints of the antennulæ very large, short and thick, especially the last one, which is as long as the two proximal ones, but broader. An oblique, broad band of dark-brown pigment-spots is on the upper side of the third joint, which gives it a somewhat strange appearance. As the distal part was broken off, it was impossible to make out the exact form of the antennal scale. The non-setous part of

the exterior margin reaches in all cases to the root of the flagellum. The three distal peduncular joints rather large, nearly quadrate, of about the same size.

Second joint of the flagellum of the mandible relatively broader than in *Amblyops abbreviata* and third joint longer, in fact nearly as long as preceding joint.

Maxillulæ and *maxillæ* as in type species. *Maxilliped* relatively shorter and broader, its third joint more broad than long, fourth a little longer than fifth, which is nearly as broad as long.

First pair of legs (gnathopod or second pair of maxilliped) much longer than maxilliped (in *Amblyops abbreviata* scarcely longer) and of a very slender form.

Second pair of legs with *unguis* slender, and nearly as long as preceding articulation.

Three pairs of incubatory lamellæ, the first of which, as usual, much the smallest.

Telson half as long as sixth joint of pleon, of an oblong-lanceolate form, nearly as in the type-species, the distal half of the lateral margins fringed with short setæ. Apex narrowly rounded.

The inner plates of the *uropoda*, twice as long as telson, of the usual lanceolate, form, auditory apparatus well developed, although small. The relative length of the inner and outer plates could not be ascertained, as the distal part of the exterior one was broken off.

Length: 17 mm.

Locality:

in 1900:

Spitzbergen, Ice Fiord, Coal Bay, depth 50 m., stones and dead shells. 16/VI—20/VI. one spec., female.

***Pseudomima* G. O. Sars 1869.**

In his paper on »Nye Dybvandscrustaceer fra Lofoten», G. O. Sars introduced in the science a new genus of *Schizopoda* closely allied to *Amblyops*, but differing from that genus in having coalesced eye-plates and more slender pereopods without any unguiform terminal joint. The species

mentioned below was described as the type of the genus. Another species, *Pseudomma affine*, was also for the first time recorded in the same memoir. In 1879, SMITH farther enlarged the genus with *Pseudomma truncatum* from the Gulf of St. Lawrence, and, in his Challenger Report, SARS described two new species, viz. *Pseudomma Sarsii* WILLEMOES-SUHM M.S. and *Pseudomma australe*; the former was dredged off Kerguelen Islands and at a station as far south as lat. 65° 42' S., and the latter in Bass Strait.¹ To these I am here going to add a new form collected in the course of the Swedish Arctic Expedition 1900. The genus will, therefore, comprise five northern and two southern species.

Although the genus, without doubt, must be regarded as of abyssal origin, it is worth while remarking that *Pseudomma australe* was obtained at a depth of 33 fathoms and *Pseudomma truncatum* once at a depth of 45 fathoms.

32. *Pseudomma roseum* G. O. SARS.

1870. *Pseudomma roseum* G. O. SARS, Nye Dybvandscrustaceer fra Lofoten, l. c. p. 154.
 1870. » » G. O. SARS, Carcinol. Bidrag til Norges Fauna etc., l. c. p. 54, tab. IV.
 1879. » » SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 98.

Localities:

in 1900:

- stat. 18. lat. 74° 30' N., long. 18° 40' W., East Greenland, S.E. of Walrus Island, depth 80—100 m., mud and stones, 4/VIII, two spec. (♀).
 » 21. East Greenland, off Kaiser Franz Joseph Fiord and Mackenzie Bay, depth 250 m., mud, 8/VIII, twelve spec. (4♂, 8♀).
 » 27. East Greenland, Kaiser Franz Joseph Fiord, Muskox-Fiord, depth 220 m., clay, 21/VIII, three spec. (♀).

This pretty Mysidean was first discovered by SARS off Lofoten Islands, where, in some places, it was rather abundant. It was afterwards obtained in the Hardanger Fiord, and by the Norwegian North Atlantic Expedition, at one

¹ In the »Fauna und Flora Grönlands», l. c. p. 200. VANHOEFFEN shortly described another species, viz. *Pseudomma parvum*, but without giving any details or figures at all.

station off the West coast of Norway, and at another S.W. of Jan Mayen. METZGER mentions it from Skagerack SW. of Lindesnäs, and SMITH from Gulf of Maine and Gulf of St. Lawrence. It was also obtained at Matotschkin Schar (STUXBERG). It must, therefore, be regarded as belonging to the cold area of the North Atlantic.

It ranges vertically from 60—70 fathoms (Matotschkin Schar) up to 400—500 fathoms (Hardanger Fiord).

Length of largest male 24 mm.

 » » female 28 mm.

33. *Pseudomma Théeli* n. sp.

Fig. 5.

Eye-scales quite coalesced, non-serrated, without any trace of a median fissure, seen from above representing an equilateral triangle, the lateral sides of which are somewhat sinuated. Antennal scale relatively much longer than in the other species, five times as long as they are broad, its outer margin terminating, as usual, in a strong spine, which, however, is situated, contrary to what is the case in the other known species, at the apex of the scale. In this respect it comes nearest to *Pseudomma Sarsii* WILLEMOES-SUHM, and is farthest remote from *Pseudomma australe*, in which this spine is situated very near the base of the scale. *Pseudomma Théeli* and *Pseudomma australe* thus represent the extreme poles in regard to the relative length of the outer margin as compared with the inner setous one, the other species being intermediate links in the series.

Telson is also of a very different appearance than in the allied species. It is very long and narrow, with the lateral sides a little sinuated. It is five times as long as it is broad (at the apex). This is subtruncated, armed with 10 strong spines, the median ones being as long as the apex is broad. Only three or four very small lateral spines are on each side above the apical ones. I was not able to detect any trace of the median pair of slender plumose setæ which occurs in the other species.

In the general appearance *Pseudomma Théeli* resembles the type species, viz. *Pseudomma roseum*. In the structure

of the oral parts there are some deviations to be found in the form of the two distal joints of the palp of the mandible, the third one being triangular, with the apex very broad. The maxillipeds and the first pair of pereopods, the gnathopods, are also relatively much shorter and thicker than in *Pseudomma roseum*, as may be seen by comparing my figures with those given by Sars in his »Carcinologiske Bidrag», I, tab. IV, fig. 11, 12.

Locality:

in 1900:

stat. 27. East Greenland, Franz Joseph Fiord, entrance of Musk-ox Fiord depth 220 m., mud, 21/VIII, two spec. (females, the one very mutilated, without pleon and the half of the pereion).

Length 20 mm.

Erythrops G. O. Sars 1869.

Nematopus G. O. Sars (preoccupied).

In the year 1863, G. O. Sars, in his »Beretning om en i Sommeren 1862 foretagen zoologisk Reise i Christianias og Trondhjems Stifter», has described two new Mysideans for which he created a new genus, *Nematopus*. Next year he added two other species, and also referred to it *Mysis erythrophthalma* described by Goës nearly at the same time. Then, in his most important paper, especially with regard to *Schizopoda*, viz. »Undersøgelser over Christianiafjordens Dybvandsfauna», he enlarges the genus with a new species, but, at the same time, changed the generic name into *Erythrops*, the old name being preoccupied. For one, of the former species he also instituted a new genus, viz. *Parerythrops* to indicate the close relationship with the typical genus. In his »Monographi over de ved Norges Kyster forekommande Mysider», the genus was thus made to include the following species: *Erythrops Goësi* (= *Mysis erythrophthalma* Goës), *Erythrops serrata*, *Erythrops microphthalma* (= *Nematopus microps*), *Erythrops pygmaea* (= *Nematopus elegans*), *Erythrops abyssorum*. Another species was described in his report on the crustaceans of the Norwegian North Atlantic Expedition, viz. *Ery-*

throps glacialis. It is worth remarking that no representative of this genus was obtained either on the Challenger Expedition or on the German Plankton Expedition. These species, all of which, when living, are very easily recognizable by their bright red eye-pigment soluble in spirit, have hitherto only been recorded from the North Atlantic and Arctic Oceans; *Erythrops pygmæa* also occurs in the Mediterranean at Messina and Naples (G. O. Sars), and, as Sars has pointed out, they are certainly of an Arctic origin only occurring along the Norwegian coast in the innermost and deepest basins of the fiords, as also many other animals of undoubtedly Arctic origin.

34. *Erythrops Goëssii* (G. O. Sars).

1864. *Mysis erythrophthalma* Goëss, Crust. decapoda marina Sueciæ etc., l. c. p. 174.
 1868. *Nematopus Goëssii* G. O. Sars, Beretn. om en i Sommeren 1865 foretagen zool. Reise etc., l. c. p. 96.
 1870. *Erythrops* » G. O. Sars, Carcinol. Bidrag til Norges Fauna etc., I., l. c. p. 24, tab. I.
 1892. » » NORMAN, British Mysidæ etc., l. c. p. 160.

Locality:

in 1898:

stat. 21. lat. 78° 27' N., long. 15° 20' E., Ice Fiord, North Fiord, depth 175 m., soft brownish clay. 19/VII, one spec.

This species, the type of the genus, was found by Lovén off Finmarken, by Lilljeborg at Christiansund, and by the Swedish Expedition, in 1861, in Wide Bay, North Spitzbergen. Later on, it was rediscovered by Sars at several places off the Norwegian coast from Hammerfest to Christiania Fiord. It also occurs off Scotland, in the Firth of Forth (Scott). Smith mentions it from Massachusetts Bay, and Stuxberg and Jarzynsky from the White Sea, Murman Coast, Matotschkin Schar, and Kara Sea. Vanhöffen enumerates it in his list of crustaceans obtained in Karajok Fiord, West Greenland. Along the Norwegian coast it occurs in depths ranging from 30 up to 100 or 125 fathoms, and seems to live exclusively on muddy bottom.

Farther north it dwells in shallower depths. In Murman Sea it was once dredged at a depth of only 10 fathoms.
Length of my spec. (a male) 15 mm.

35. *Erythrops abyssorum* G. O. SARS.

1869. *Erythrops abyssorum* G. O. SARS, Undersøg. over Christiania fiordens Dybvandsfauna, l. c. p. 326.
1870. " " G. O. SARS, Carcinol. Bidrag til Norges Fauna etc., l. c. p. 36. tab. V, fig. 1—12.

Localities:

in 1899:

stat. 25. lat. 72° 28' N., long. 21° 48' W., depth 180 m., muddy bottom, some stones, 24/VII, one spec.

in 1900:

stat, 16. lat. 72° 25' N., long. 17° 56' W., E. of Greenland, depth 300 m., stones and sand, 30/VII, four spec.

This species, which is closely allied to *Erythrops serrata* G. O. SARS, was first discovered by the great Norwegian carcinologist in great abundance in an isolated deep basin off the exterior part of the Christiania Fiord where it occurred on muddy bottom, in depths ranging from 150 to 230 fathoms. There it was living together with *Munnopsis typica*, *Eurycope cornuta*, and other Arctic crustaceans. Afterwards it was observed off Lofoten Islands, and, on the Norwegian North Atlantic Expedition, in the Porsanger Fiord, and also off Jan Mayen. It was, moreover, obtained during the Dijnphna Expedition at four stations in the Kara Sea. It was also obtained by VANHÖFFEN in Karajok Fiord, West Greenland. Its occurrence off East Greenland, together with the finds of it mentioned above, thus attest its Arctic origin. In the Arctic Ocean it seems to live in shallower water, e. g., in the Kara Sea, it was taken at a depth of 51 fathoms.

As SARS has shown, this species is subject to some variations in the size of the eyes and the length of the pereopods. The deeper the water in which it lives, the smaller become the eyes; and, on muddy bottom, the legs aer

always longer than in specimens living on more firm and compact bottom. This interesting fact, viz., the modifying influence of the bottom on the length of the pereopods, the same author also states with regard to the other species of the genus. *Erythrops pygmæa*, which dwells very often on sandy bottom, has also relatively the shortest legs, whilst *Erythrops serrata* and *Erythrops microphthalma*, living always on muddy bottom, are provided with the longest ones. Now, SARS points out this interesting fact to be observed even in the same species.

Of my specimens, three were males and two females.

Length of larest male 18 mm.

» » » female 15,5 mm.

36. *Erythrops glacialis* G. O. SARS.

1877. *Erythrops glacialis* G. O. SARS, Prodr. descript. Crust. etc., l. c. p. 242.

1885. » » G. O. SARS, Norw. North. Atl. Exp. I, p. 45, pl. 5, fig. 1—4.

Locality:

in 1900:

stat. 21. East Greenland, off Kaiser Franz Joseph Fiord, between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, one spec.

This species was obtained in two specimens during the Norwegian North Atlantic Expedition in the open sea off the coast of Norway at two stations. Both belong to the cold area, and the depths were 498 and 350 fathoms resp. As it has now been found also off East Greenland, SARS is, no doubt, right in suggesting that it may unquestionably be regarded as a true Arctic form.

My specimen was a male with well developed pleopods of the typical biramous appearance. In no detail, did it deviate from the description and figures which SARS has given of it in the work cited above.

Length: 17 mm.

Parerythroptus G. O. SARS. 1869.

Among the species belonging to *Nematopus* (*Erythroptus*), G. O. SARS described, in 1864, one species which deviated so much in some points of its structure, that the author, even at that time, only with great hesitation included it in the genus. Having afterwards discovered some other species all agreeing with each other, but deviating from *Nematopus obesus*, he established then in 1869, in his »Undersøgelser over Christianiafjordens Dybvandsfauna» a new genus, viz. *Parerythroptus*, for this species. Two other species, viz. *Parerythroptus abyssicola* from the deep basins of the Sogne Fiord, and *Parerythroptus spectabilis* from two stations of the Norwegian North Atlantic Expedition, were then, in 1877, shortly described by the same author. To the same genus is now generally referred another species described, from the coasts of New England in 1879, by SMITH as *Meterythroptus robusta*.

As the preceding genus, this includes also deep sea forms of an undoubtedly Arctic origin. Up to now the genus has not been met with in other seas except in the cold area of the North Atlantic and in the Arctic Ocean.

37. Parerythroptus robusta (SMITH).

1879. *Meterythroptus robusta* SMITH, Stalk-eyed Crust. Atl. Coast North America, l. c. p. 93, pl. XII, fig. 1, 2.
 1879. *Parerythroptus* » G. O. SARS, Carcinol. Bidrag til Norges Fauna etc., l. c. III, p. 98, tab. XXXIX.

Locality:

in 1900:

- stat. 19. lat. 74° 35' N., long. 18° 15' W., East Greenland, S.E. of Pendulum Island, depth 150 m., mud and stones, 5/VIII, seven spec. (4 ♂, 3 ♀).

This species was first observed in Massachusetts Bay and in the Gulf of St Lawrence by the late distinguished carcinologist Prof. SMITH, who proposed a new genus for it, mainly on account of the different structure of the first pair of pleopods in the male, the endopodite being here rudimen-

tary, soft, and membranaceous. Meanwhile, it was found by Sars at Bodø and in the Varanger Fiord, and, on the Norwegian North Atlantic Expedition, in the Porsanger Fiord, and off South Cape, Spitzbergen. Sars does not regard the deviating form of the endopodite of the first pair of male pleopods as of generic value; but, as the species in all other points closely agrees with the other known species of *Parerythropterus*, he includes it in this genus.

It also occurs in the Kara Sea (Dijmphna Expedition) and off East Greenland (Swed. Arct. Exp. 1900). It must, therefore, be considered as decidedly Arctic, but as to how far Sars is right in supposing it also to be circumpolar is a detail which must be left to future researches to prove.

It ranges bathymetrically from 33 up to 150 fathoms. It lives mainly on muddy bottom, sometimes mixed with sand.

Length of largest male. 23 mm.

» » » female. . . . 21 » .

One of the females in my collection had in the marsupium six eggs of rather large size. The cleavage was finished, but the formation of the embryo had not yet begun.

In the other two females the marsupium contained about twenty young ones, most of which were of a length of 4 mm.

38. *Parerythropterus spectabilis* G. O. Sars.

1877. *Parerythropterus spectabilis* G. O. Sars, Prodr. descript. Crust. etc., l. c. p. 243.

1885. » » G. O. Sars, Norweg. North Atl. Exp. I, p. 47, pl. 5, fig. 5—12.

Localities:

in 1899:

stat. 18. lat. 74° 52' N., long. 17° 16' W., depth 350 m., muddy clay, sand and pebbles, 4/VII, one spec. (♂).

in 1900:

stat 21. East Greenland between Bontekoe Island and Mackenzie Bay, depth 250 m., mud, 8/VIII, several spec. (15♂, 12♀).

This species, which is distinguishable by its considerable size, the its eyes, and the armature of the apex of telson,

was obtained during the Norwegian North Atlantic Expedition at two stations far distant from each other, but both belonging to the cold area, the one being situated off Stor-eggen NW. off Cape Stadt and the other SW. of Jan Mayen. It also occurs off West Greenland, Karajok Fiord (VAN-HÖFFEN).

Its vertical range is from 250 up to 763 metres, and it is undoubtedly of Arctic origin.

Length of largest male 23 mm.
 » » » female 20 » .

Mysideis G. O. Sars 1869.

In his »Undersøgelser over Christianiafjordens Dybvands-fauna», Sars established this genus to receive a Mysidean obtained by him at great depths in the Christiania Fiord, and first named *Mysis insignis* by the same author in »Beretning om en i Sommeren 1863 foretagen zoologisk Reise i Christiania Stift». The genus comes nearest to *Mysidopsis*, although deviating from that genus in the structure of mandibles and of the second pair of maxillæ. Sars added, then, to the genus in 1879, in the third part of his »Carcinologiske Bidrag til Norges Fauna», another form already described in 1863 by Goës as *Mysis grandis* and occurring rarely off the coasts of Finmarken and Spitzbergen.¹ No other species have as yet been described.

39. Mysideis grandis (Goës).

1864. *Mysis grandis* GOËS, Crust. decap. podophth. mar. Sueciæ etc., l. c. p. 176.
 1879. *Mysideis* » G. O. Sars, Carcinol. Bidrag til Norges Fauna etc., III, p. 106, tab. XLI—XLII.
 1892. *Stilomysis* » NORMAN, British Mysidæ etc., l. c. p. 148.
 1900. » » STEBBING, Arctic Crustacea etc., l. c. p. 11.

¹ In 1892, NORMAN made this the type of a new genus, for which he proposes the name *Stilomysis*, but without giving any detailed description of the genus. It seems to me very uncertain how far he is right in establishing this genus.

Localities:

in 1898:

- stat. 39. lat. 79° 43' N., long. 10° 52' E., Danes' Island, Virgo's Harbour, depth 25—30 m., gray clay, Laminariæ, 27/VIII, one spec.

in 1900:

- stat. 2. West Spitzbergen, Ice Fiord, Coal Bay, depth 100 m., rocks, 16/VI—20/VI, one spec. (♀).
 » 3. ibidem, depth 50—100 m., stones, 12/VI, three spec. (2♂, 1♀).
 » 5. ibidem, Green Harbour, depth 10—80 m., stones, 25/VI, one spec.
 » 8. West Spitzbergen, Kings Bay, depth 10—30 m., stones and sand with Laminariæ, 29/VI, one spec. (♂).
 » 19. East Greenland, S.E. of Pendulum Island, lat. 74° 35' N., long. 18° 15' W., depth 150 m., mud and stones, 5/VIII, three spec. (♀).
 » 26. East Greenland, Franz Joseph Fiord, the innermost part of Muskox Fiord, depth 100 m., clay, 17/VIII, one spec. (♀).

This species was first obtained by the illustrious Swedish zoologist LOVÉN off the coast of Finmark where it was afterwards observed by SARS. It was described by GOËS from specimens collected at Spitzbergen. STEBBING mentions it from the Barents Sea from lat. 70° 51' N., long. 53° E. HANSEN from West Greenland in lat. 65° 35' N., long. 54° 50' W. and VANHÖFFEN from Karajok Fiord. Its area of distribution has now, by the Swedish Arctic Expedition, been enlarged by the addition of East Greenland. Thus, it seems to belong exclusively to the Atlantic part of the Arctic Ocean.

It ranges vertically from a few (5) up to 100 fathoms.

Length of largest spec. (a female from stat. 26) 39 mm.

Mysis LATREILLE 1803.

This genus, in its widest sense, comprises many species, but it has now been subdivided into several genera, mainly by SARS and NORMAN (l. c.). LATREILLE's original genus has been restricted by the last author to the species to be mentioned below and to the well-known fresh-water form *Mysis relicta* LOVÉN.

40." *Mysis oculata* (O. FABRICIUS).

1780. *Cancer oculatus* O. FABRICIUS, Fauna Groenlandica, p. 245, u. 222, Fig. 1. A—B.
 1846. *Mysis oculata* KRÖYER, Voy. en Scand. etc., l. c., Pl. 8, Fig. 2 a—r, Fig. 3 a—f.
 1861. » » KRÖYER, Mysidæ, l. c. p. 13.
 1879. » » G. O. SARS. Carcinol. Bidr. etc., III. p. 69, Tab. XXXI.
 1887. » » HANSEN, Dijnphna-Togtets zool. bot. Udbytte etc., l. c. p. 251, tab. XXIII, fig. 2—2 b.

Localities:

in 1898:

- stat. 4. lat. 74° 21' N., long. 19° 15' E., Beeren Island, depth 14—18 m., rocky bottom with algæ, pebbles, and sand, 17/VI, one spec.
 » 8. lat. 76° 50' N., long. 17° 20' E., Stor Fiord, depth 14—18 m., stony bottom with Laminariæ, 25/VI, two spec.
 » 21. one spec.
 » 29. lat. 78° 40' N., long. 27° 10' E., King Charles Land, Swedish Foreland, depth 14—16 m., bottom temp. + 0,9° C., soft, grayish-black, sand, stones, mud, and algæ, 5/VII, two spec.
 » 30. King Charles Land, Swedish Foreland, depth 10—16 m., soft, grayish-black sand, stones, mud, and algæ, 6/VIII, many spec.
 » 31. King Charles Land, Swedish Foreland, depth 12—20 m., soft, grayish-black clay, 8/VIII, many spec.
 » 32. King Charles Land, Rivalen Sound, depth 100—110 m., bottom temp. — 1,45° C., soft clay with boulders, 8/VIII, one spec.
 » 39. lat. 79° 43' N., long. 10° 52' E., Danes Island, Virgo's Harbour, depth 25—30 m., gray clay, Laminariæ, 27/VIII, two spec.

in 1899:

- stat. 10. Jan Mayen, Mary Muss Bay, depth 7—9 m., sand and algæ, 19/VI, two spec.
 » 29. lat. 70° 27' N., long. 22° 35' W., Scoresby Sound, Cape Stewart, depth 13—18 m., mud, stones, and algæ, 30/VII, two spec.
 North Spitzbergen, Danes Gat, depth 20—30 m., 7/VII, many spec. WULFF.

in 1900:

- stat. 3. West Spitzbergen, Ice Fiord, Coal Bay, depth 50—100 m., stones, 22/VI, one spec.
- » 5. West Spitzbergen, Ice Fiord, Green Harbour, depth 10—80 m., stones, 25/VI, eight spec.
- » 8. West Spitzbergen, King's Bay, depth 10—30 m., stones and sand with Laminariæ, 29/VI, six spec.
- » 15. East coast of Jan Mayen, depth 70—80 m., sand, 22/VII, many spec.
- » 17. East Greenland, Mackenzie Bay, N. of Kaiser Franz Joseph Fiord, depth 12—35 m., mud, 1/VIII—3/VIII, several spec.
- » 23. ibidem, depth 3—10 m., mud and sand with Laminariæ, 11/VIII, many spec.
- » 24. East Greenland, Mackenzie Bay N. of Kaiser Franz Joseph Fiord, depth 1—3 m., sand, 11/VIII, two large and many young spec.

Distribution:

Mysis oculata is, without doubt, the most common among Arctic Mysideans, and at the same time, sometimes occurs in enormous shoals, rivalling *Rhoda inermis* and *Nyctiphanes norvegica* in its multitude of specimens. In fact, these species supply some Balænopterids and sea-birds with their essential food. *Mysis oculata* has been obtained off West Greenland, in Smith Sound, off Baffin Land, Labrador, and New England, in the Siberian Polar Sea W. of Tajmur Peninsula, Kara Sea, Murman Sea, round Spitzbergen, off Finmarken, Iceland, Jan Mayen, and East Greenland. It must, therefore, be considered an Arctic species; although it was not obtained, according to Stuxberg, during the Vega Expedition E. of Tajmur Peninsula, and although it has not yet been observed, as far as I know, in the Behring Sea or the adjacent parts of the Arctic Ocean, further discoveries in these tracts of the sea, hitherto so little explored for zoological purposes, will, I think, prove that it must also be regarded as circumpolar.

It lives in moderate depths from a few up to 20 fathoms. Such depths as 80—100—110 metres, which are recorded above in the list of localities, are the greatest I have found for the species; but, as HANSEN has pointed out, it is very probable that it lives pelagic a great deal of the year, and, therefore, the above figures are not very trustworthy, as the animal might have been taken by the trawl when carried up.

Length of largest spec.: 28 mm. A specimen which I dredged in 1894 in Smith Sound, measured 33 mm. (OHLIN, l. c. p. 9).

41. *Mysis mixta* LILLJEBORG.

1852. *Mysis mixta* LILLJEBORG, Hafs-Crust. vid Kullaberg etc., l. c. p. 6.
 1861. > *latitans* KRÖYER, Mysidæ, l. c. p. 30, tab I, fig. 4 a—b.
 1879. > *mixta* G. O. SARS, Carcinol. Bidr. etc., l. c. III, p. 76. tab. XXXIII.

Localities:

in 1900:

- stat. 17. East Greenland, Mackenzie Bay, N. of Kaiser Franz Joseph Fiord, depth 12—35 m., mud, 1/VIII—3/VIII, four spec.
 > 23. ibidem, depth 3—10 m., mud and sand with Laminariæ, 11/VIII, several spec.

This species was first described by LILLJEBORG from specimens obtained in Öresund. Nine years afterwards KRÖYER redescribed it as *Mysis latitans* after specimens from Greenland; but, as SARS has pointed out, both are indetical. The species is very often to be found together with *Mysis oculata*, which it closely resembles, but from which it is easily to be distinguished by the pointed *squamæ antennarum*, the somewhat different form of the incisure of the telson, and by a lighter colour, the black star-formed spots being here of smaller size.

Mysis mixta has been obtained off East and West Greenland, New England as far south as Massachusetts Bay, Iceland, Lofoten Islands, and Finmarken. Although it is on this account, to be regarded as an Arctic species, it occurs, however, farther south, viz. in the interior part of Christiania Fiord, in Öresund, and in the Baltic.

It seems to live in the Arctic in the same depths as the preceding species, but, farther south, it dwells in deeper water. Thus according to SMITH, it has been obtained, off the coasts of New England, only in depths varying from 20 up to 90 fathoms.

Length of largest spec. 30 mm.

Pseudomysis G. O. Sars 1879.

Among the new and interesting finds with which our knowledge about Arctic crustaceans was enriched by the Norwegian North Atlantic Expedition, is a Schizopod for which Sars has established a new genus, viz. *Pseudomysis*. Unfortunately he had only two very mutilated specimens, both females, at his disposal, so that his description is, in some respects, incomplete. During the Swedish Arctic Expedition 1898 I got a fragment of this remarkable Mysidean from the »Swedish Depth» together with a few specimens of *Boreomysis scyphops*. As that fragment happens to be the very mutilated pleon of a male, I am here able to complete Sars' description with regard to that important part.

42. Pseudomysis abyssi G. O. Sars.

1879. *Pseudomysis abyssi* G. O. Sars, Crust. et Pycnog. nova etc.,
l. c. p. 430.
1885. » » G. O. Sars, Norweg. North Atl. Exp. I,
p. 50, pl. 5, fig. 13—21, pl. 20, fig.
18—20.

Locality:

in 1898:

- stat. 26. lat. 78° 19' N., long. 8° 41' E., the »Swedish Depth»,
depth 2700 m., bottom temp. — 1,4° C., Biloculina clay,
25/VII, one spec. (very mutilated pleon of a male).

Although my fragment of this species is in a very bad condition, it evidently proves that this deep-sea Mysidean comes nearest to *Boreomysis* or *Mysideis*, as Sars has already, suggested, on account of the structure of the oral parts. The pleopods of the male are developed as two-branched swimming-plates. It is, however, impossible for me to give any exact description or complete figures of them, because they are broken and much mutilated. Contrary to what is usually the case, they all seem to be of about the same size and structure. Even the first pair has the endopodite well developed and is not rudimentary. I have figured the fifth pleopod, which was most complete. The endopodite is here

longer than the exopodite, and uniarticulate, although I can not be quite certain as to this, as one or two articulations may be broken off. I am not able to decide if the usual plate at the base of the inner branch is wanting. I think, however, that an indication of it is to be found. I have marked it in the figure with *x*. The exopodite is much smaller, and consists of five joints, the first of which is by far the largest. Thus, the male pleopods deviate in some points from the allied species, but, as this is the case even in species belonging to the same genus, f. i. *Mysideis insignis* and *M. grandis*, I think that this unusual structure ought not to prevent us from thinking that Sars is right, in considering that *Pseudomysis* approximates closest to *Mysideis*.

This species is an inhabitant of the deep basin between East Greenland on the one side, and Spitzbergen-Norway on the other. One of Sars' specimens was taken in the trawl N.W. of Finmark at the depth of 1110 fathoms, the other was found in the ventricle of *Rhodichthys regina* from a station farther West, at a depth of 1280 fathoms.

Length of pleon of my specimen 19 mm. Sars estimated the length of his largest specimen, which, however, was not fullgrown, to be about 35 mm.

Note. It ought to be observed that »Rivalen Sound» and »Giles' Land» in this treatise are nominated respectively »Bremer Sound» and »White Island» in my previous paper. The reason is that I then followed the English sea-chart. As Prof. NATHORST has shown that the term »Rivalen Sound» has priority to »Bremer Sound», the former name must consequently be used. And as he has also shown that »White's Island» is the same as »Giles' Land», the latter appellation is the correct one.

Explanation of the figures.

Fig. 1. *Bythocaris simplicirostris* G. O. SARS.

I. Carapace from side. II. Second, third, and fourth segments of pleon. a_1 . antennula a_2 . scale of antenna, $m\alpha p_3$ -third maxilliped p_2 . second pereopod. .

» 2. *Pandalus borealis* KRÖYER, chela of first pereopod.

» 3. *Boreomysis nobilis* G. O. SARS.
Mp. palp of mandible, *U.* uropods.

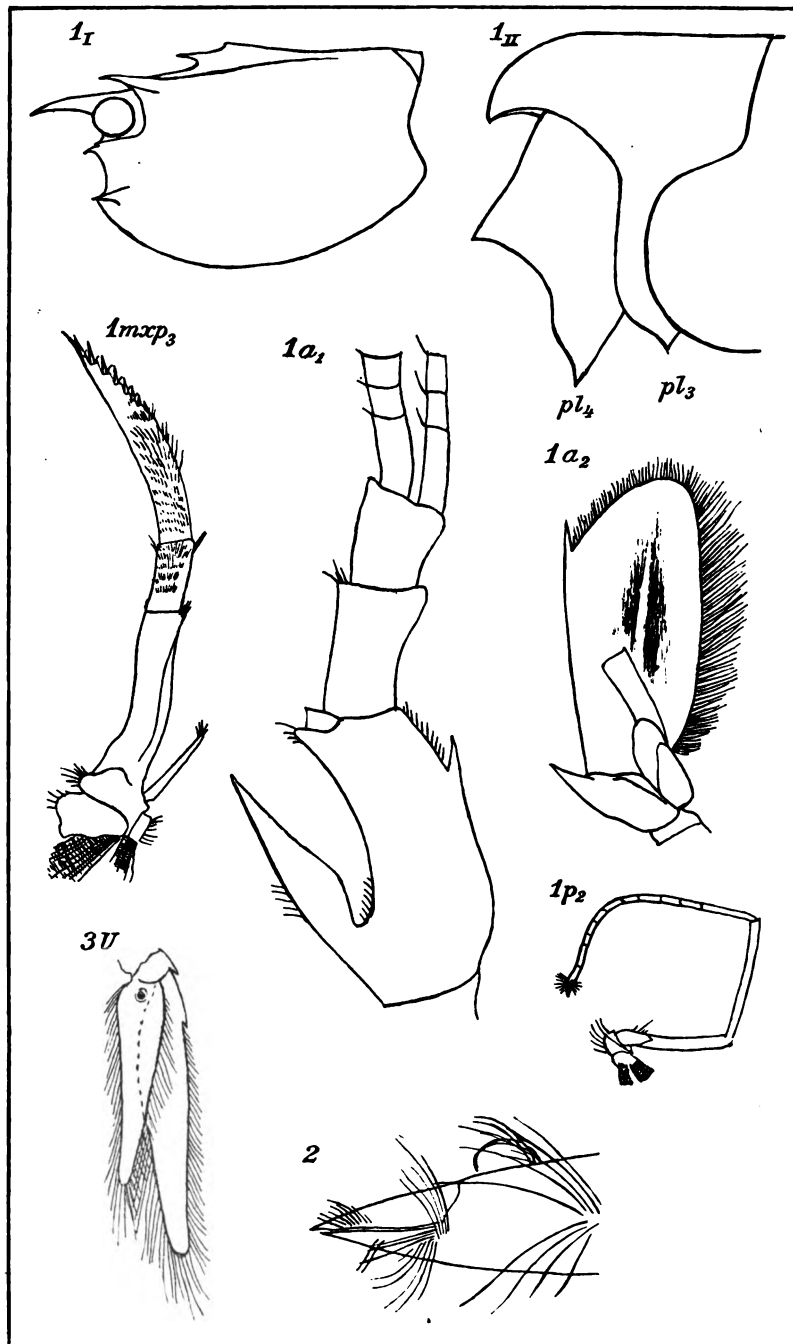
» 4. *Amblyops Sarsi* n. sp.

I. From above, II. Cephalic portion, from above, III. same from side. *T* + *U*, telson and uropods.

» 5. *Pseudomma Théeli* n. sp.

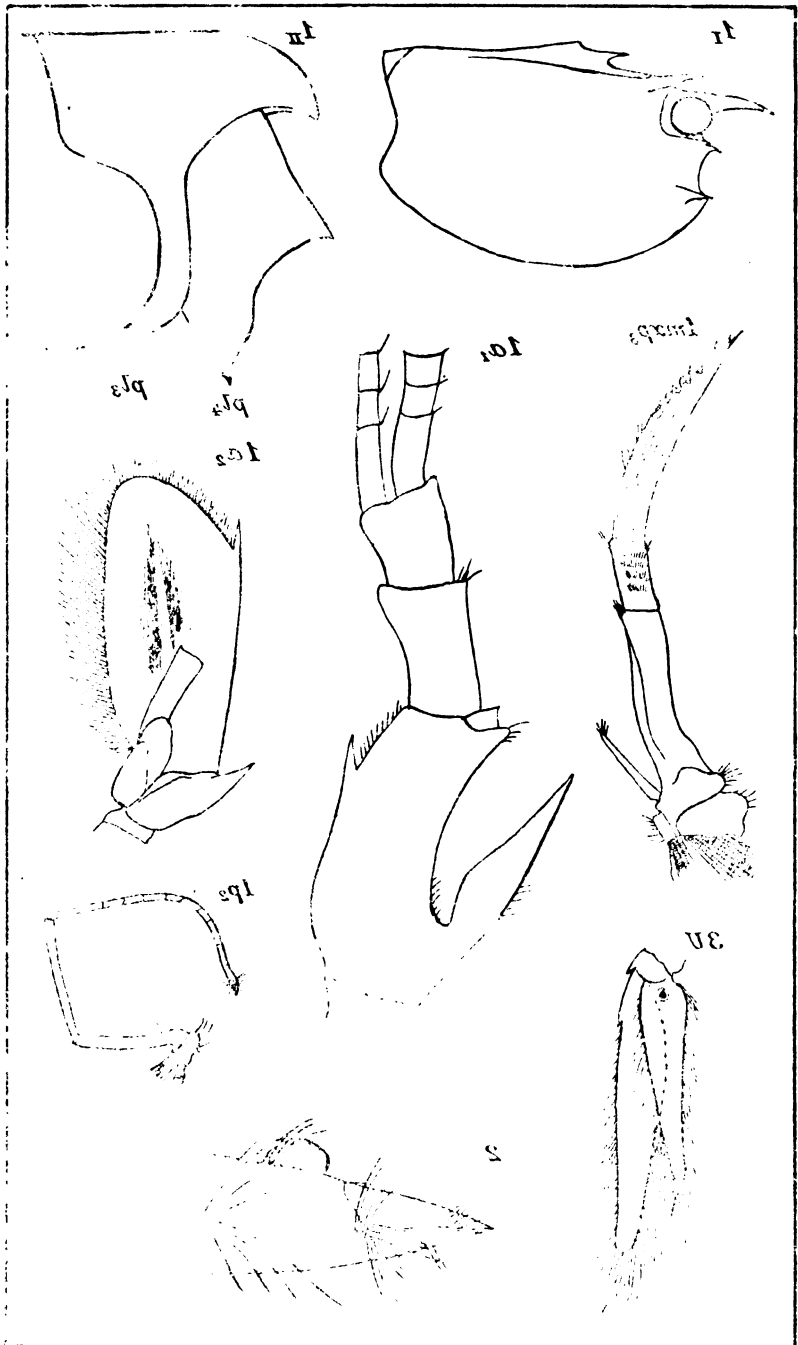
I. Cephalic portion, from above, a_2 . antenna, *Mp.* palp of mandible, $m\alpha p$. maxilliped, p_1 , first pereopod (gnathopod). *U*, uropods, *T*. telson.

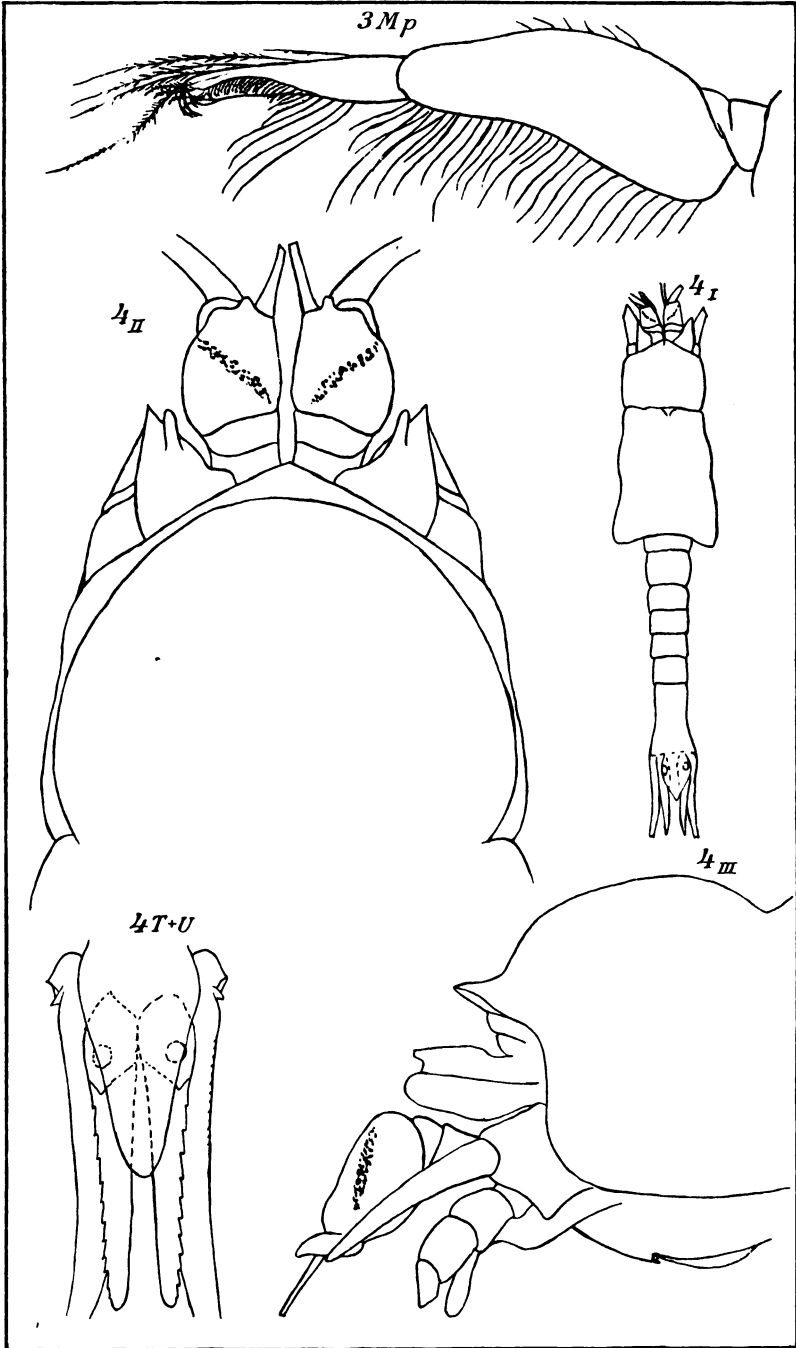
» 6. *Pseudomysis abyssi* G. O. SARS, fifth pleopod of male.



A.Ohlin. del.

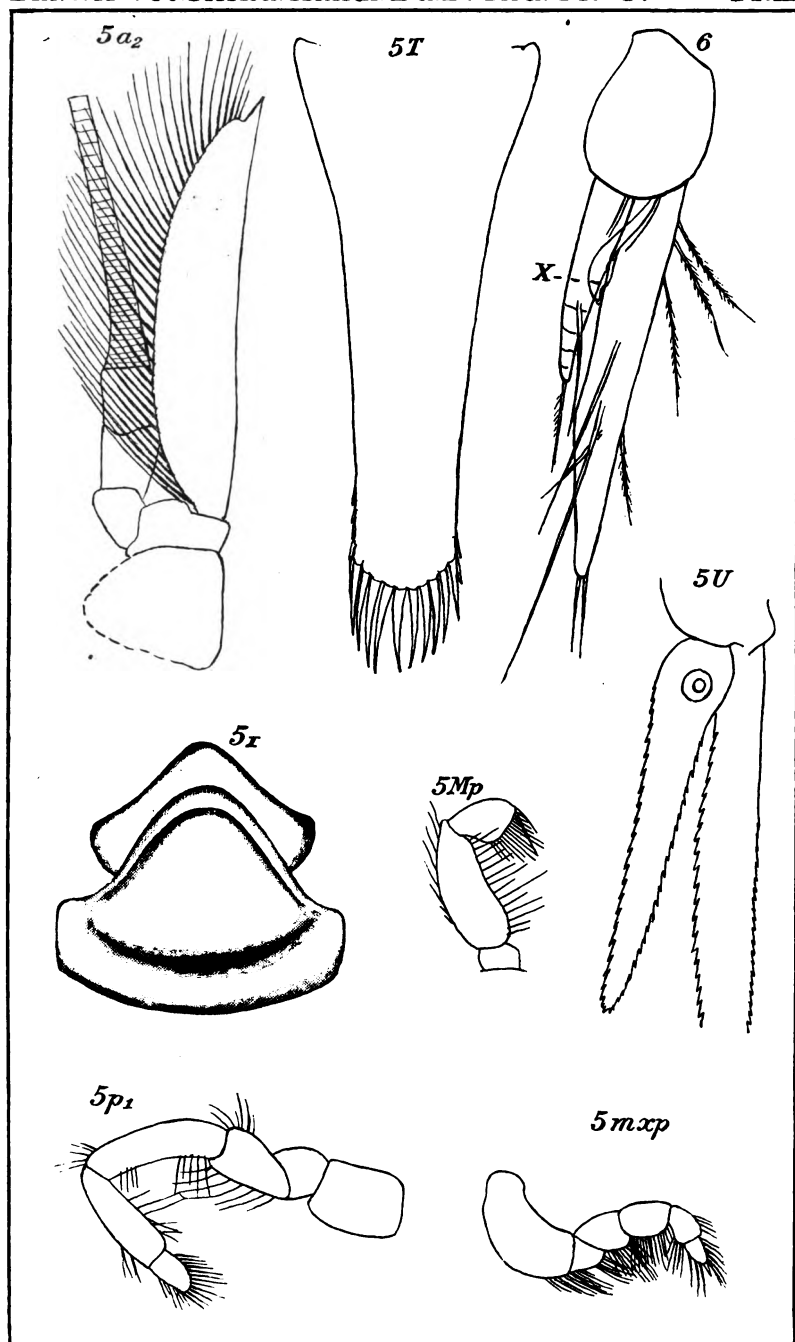
J.Cederquist foto.





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